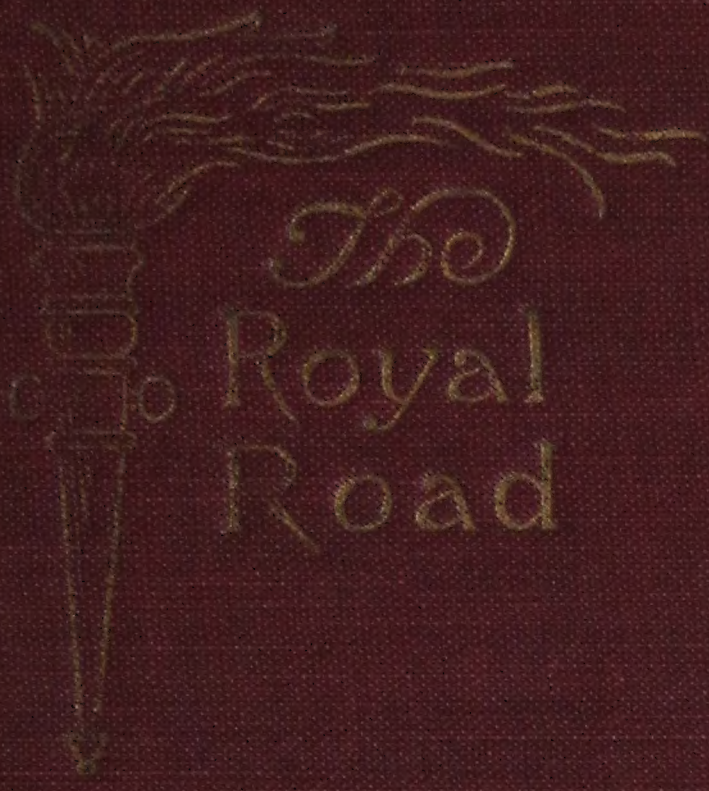

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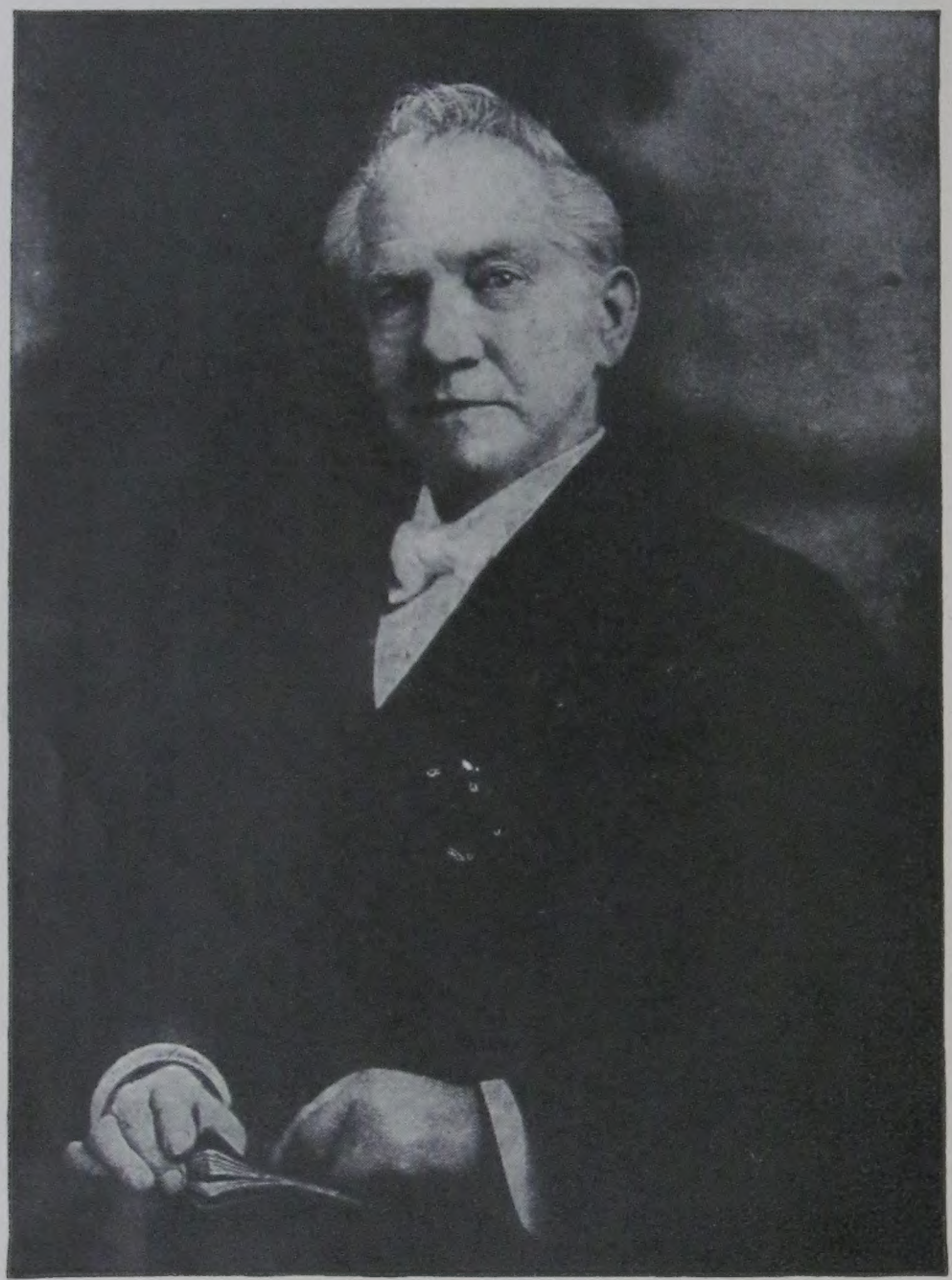

Chas. N. Upmund

The Royal Road

BY

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THREE HUNDRED AND SEVENTY-SEVENTH EDITION

COMPLETELY REVISED AND ILLUSTRATED

BY

L. H. PINCO, M. D.

PUBLISHED BY

TYRRELL'S HYGIENIC INSTITUTE, INC.

152 WEST 65TH STREET, NEW YORK

1927

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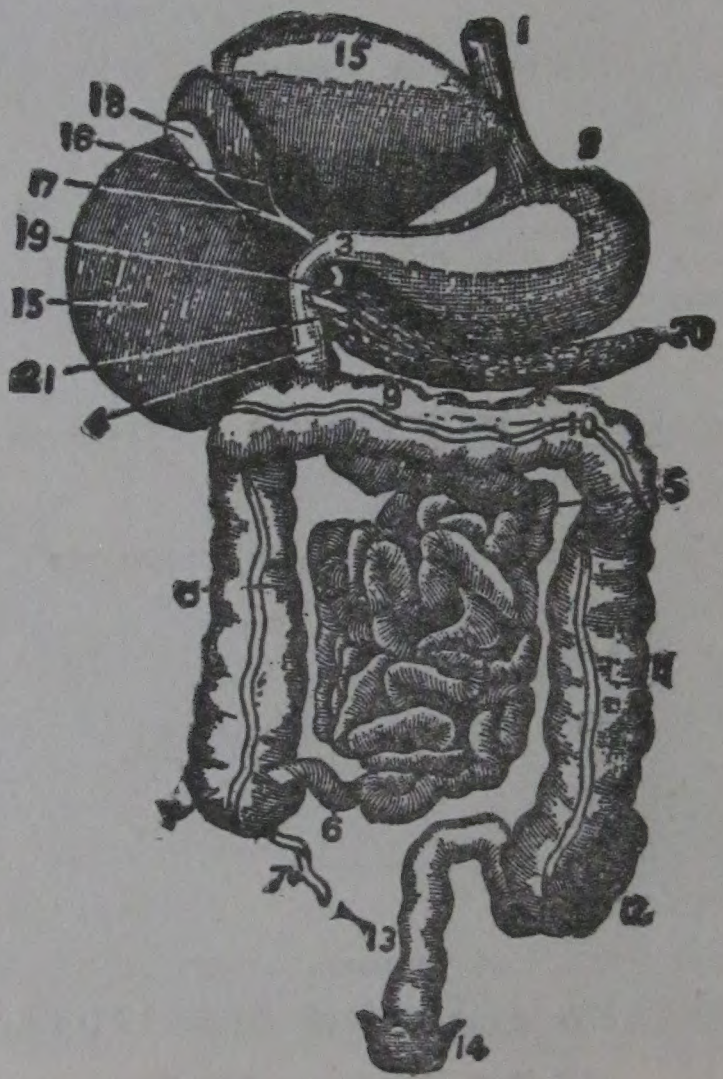

THE DIGESTIVE ORGANS

(Viewed from the front.)

DESCRIPTION OF THE DIAGRAM

ILLUSTRATING THE

DIGESTIVE ORGANS OF MAN

1. Esophagus or Gullet.
2. Cardiac end of Stomach.
3. Pyloric end of Stomach.
4. Duodenum.
5, 6. Convolutions of Small Intestines.
7. Cæcum.
7* Vermiform appendage of Cæcum, called the *appendicula vermiformis.*
8. Ascending Colon.
9, 10. Transverse Colon.
11. Descending Colon.
12. Sigmoid Flexure, the last curve of the Colon before it terminates in the Rectum.
13. Rectum, the terminal part of the Colon.
14. Anus, posterior opening of the alimentary canal, through which the excrements are expelled.
15. Lobes of the Liver, raised and turned back.

16. Hepatic Duct, which carries the bile from the liver to the Cystic and Common Bile Ducts.

17. Cystic Duct.

18. Gall Bladder.

19. Common Bile Duct.

20. Pancreas, the gland which secretes the pancreatic juice.

21. Pancreatic Duct, entering the Duodenum with the Common Bile Duct.

The illustration on page 2 of the Digestive Apparatus of man represents the organs of food digestion, especially the alimentary canal and glands connected therewith, and to the reader of this book, or to any student of anatomy, it will be found of invaluable service as a reference.

The diagram gives a view of the digestive organs from the ventral or front side, a proper study of which cannot fail to impress every intelligent being with the reverential deduction of the Psalmist that we are *"fearfully and wonderfully made."*

PREFACE

TO THE

THREE HUNDRED AND SEVENTY-SEVENTH EDITION

In presenting to the public the three hundred and seventy-seventh edition of this work, it is a matter for profound gratification to be able to state that the valuable suggestions described in its pages has steadily increased in public favor since its introduction. Thousands of grateful people testify to its value, not only for the information given, but better still, for the results obtained. Truth must ever prevail, and this treatment being based on natural law (which is unerring), must achieve the desired result, which is the correcting of unnatural conditions.

This edition has been completely revised and much of it re-written, and while the essential principles remain unchanged, some slight departures from previously expressed

opinions may be noted; for in the years that have elapsed since the first edition saw the light, some notable advances have been made in rational therapeutics and dietetics, and no one can afford to lag behind the car of Progress.

The arrangement of the book has been still further altered, by adding another part, making nine in all, each part being devoted to a special phase of the general subject, thus simplifying it, and making its principles easier of application. Several new suggestions have been added to those that have appeared in previous editions.

While painfully conscious that the critically disposed may find something to condemn in its pages, the work is sent forth with the fervent hope that despite any defects it may possess it may, in the future, as in the past, prove the means of giving the public valuable information in such a simplified form that it can readily be understood.

L. H. Pinco, M.D.

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PART I.

The True Cause of Abnormal Conditions.

Health is such an inestimable blessing, that the individual who shall devise means to preserve it, or to restore it, when lost, is deserving of all the thanks and honors that a grateful community can bestow. Unfortunately, there are very few who estimate life at its true value, until they are confronted with the grim destroyer, Death. No one can fully appreciate the priceless blessings of health until they feel that it has slipped from their grasp. The oft quoted phrase, "Health is Wealth," is truly a concrete expression of wisdom, for without the former, the latter is well nigh an impossibility. But its interference with the activities of life

is one of the least evils of sickness, for *perfect health* is the very salt and spice of life; without it, existence is "weary, stale, flat and unprofitable."

But let none despair, for it is our purpose to give suggestions to those who enjoy the blessings of robust health to help them preserve it indefinitely, and how those who have through constipation lost it may regain it—with excess of vigor, and once more feel that life is *indeed* worth living.

The great need of the present day is adequate instruction in physiology and hygiene, that humanity may not only know how to secure the restoration of health, when lost, but by attention to physiological and sanitary laws may retain good health indefinitely. The body is the theatre of constant change. The processes of tearing down and building up proceed without intermission during life. During every moment of life, waste is being formed by the destruction of tissue, and this effete material must be promptly removed if the individual would enjoy health. Nature has provided adequate means for the removal of

these substances which are valueless to the economy, the retention of which obstructs and irritates the complex mechanism of the system, the principal avenues for its expulsion being the lungs, the skin, the kidneys, and the intestinal canal.

The latter is infinitely more important than the others, since by it the waste products of digestion are expelled. If it fails to promptly fulfill its office, every vital function is interfered with; and the waste is re-absorbed directly into the circulation, redepositing in the very fountain of life matter which the system has thrown off as worthless. Should the system be exposed to a chill while in this condition, a congestion of the surface excretory vessels takes place; and practically the whole work of elimination is thrown upon the already hard-worked kidneys, frequently resulting in uræmic poisoning and death.

The presence of a grain of sand in a watch will retard its movements, if not arrest them altogether. What, then, must be the result of an accumulation of impurities in the physical system? The finely adjusted balance that is

capable of weighing the thousandth part of a grain is carefully protected under a glass cover, for even impalpable dust would clog its movements. Reflect, then, upon the amount of friction that must be perpetually going on in the human organism owing to the retention of waste matter! And since not even the most cunning product of man's handiwork can compare with the intricate mechanism of the body, the importance of eliminating the waste becomes manifest. Here, in a nutshell, lies the predisposing cause of many conditions.

Let us now consider how the retention of waste affects the system—how the deleterious effects are produced. There are three factors at work in this process, mechanical, gaseous and absorptive. We will first consider the mechanical.

Nature has beautifully apportioned the space in the abdominal cavity, each part of the viscera having ample room for the performance of its special function, but any abnormal increase in size of any part of the contents of the cavity must necessarily create disturbance. Now, when the food leaves the stomach, where

it has been churned into a pulpaceous mass, it passes into the short duodenum, or first part of the small intestine, where it receives an augmentation of liquid material from the liver and pancreas; consequently, when it reaches the remainder of the small intestine, where the greatest amount of absorption takes place, it is in a well diluted condition. During its passage through the small intestine, the nutrient portion of the food is abstracted from it by the villi (small hair-like processes) with which the small intestine is thickly studded, so that at the end of its journey of about twenty-two feet (if digestion is normal), most that is of food value to the organism has been appropriated—the remainder being refuse. The waste product passes into the colon, or large intestine, and should be promptly expelled. If prompt expulsion does not take place, this is what happens: The fluid portion of this semi-liquid waste is re-absorbed through the walls of the colon directly into the circulation. This process known as constipation goes on from day to day, week to week, month to month, until it not infrequently happens that the

colon becomes distended to several times its natural size. Instances are on record, where these abnormal accumulations of fæcal matter in the colon have been mistaken for enlargement of the liver, and even pregnancy. A surgeon in London has a preparation of the colon measuring some twenty inches in circumference, containing three gallons of fæcal matter, and even larger accumulations have been reported. The foregoing instances are, of course, exceptional. It is impossible to estimate the amount of evil caused by an engorged colon monopolizing two or three times its allotted space in the abdominal cavity, crowding and hampering the other organs in their work.

But the effects of direct mechanical pressure are not the only ones. Undue retention of food, with consequent fermentation may oftentimes occur; while the irritation, due to pressure on the nerve terminals by the distension, and by the encrusted matter adhering to the intestinal wall, may be harmful.

The effects of gaseous accumulations in the alimentary canal are not thoroughly under-

stood at present—that is—the pathological effects. The more direct effects, as manifested in abdominal distension, and the terrible distress that frequently follows, are unfortunately, but too well known. The reader does not need to be told that during the decomposition of organic substances, gases are evolved, and no matter where the process goes on, the results are always the same. Owing to the causes previously mentioned, the intestinal canal usually offers special facilities for the production of gases, owing to the retention of partially digested food, in a medium highly favorable to fermentation.

This liquid refuse in the colon is composed of substances for which the system has no further use—it has rejected them; consequently they are foreign bodies, and as such, should be quickly eliminated. It is known now, that water and part of this decomposing substance may be absorbed, carrying into the system soluble poisonous or decomposed matter which may be present.

Having shown that the average colon is a fertile breeding ground for all kinds of germs,

bad as well as good, it may be interesting to explain how part of this waste might be conveyed to the various organs of the body.

We have in our bodies a system of canals called arteries and veins, having their head at the heart, which is the main pump that keeps the blood in motion. The arterial circulation consists of those channels which convey the blood—supposed pure blood—away from the heart to the different parts of the body, loaded with the life-giving principle of sustenance, invigoration and heat, while the veins or venous circulation conveys to the heart and lungs the impure blood.

Now, in the blood, as it courses through our bodies, are myriads of little discs called corpuscles; these are what give the blood a red color. There are also a smaller number of white corpuscles, that are known as phagocytes, whose mission is to destroy micro-organisms that are prejudicial to life. In order that you may know their use, we, for convenience sake and to make our meaning better understood, will call them little soldiers. These little warriors are continually sailing

through our bodies, hunting for germs of disease or waste, that they catch and destroy.

Now, suppose we take a violent cold, with a closing of the pores of the skin, and that at the same time the colon is engorged, two of the most important outlets for the filth and decayed matter of our bodies are closed up—for the life of our bodies is one continual process of building anew and tearing down; these two most important sewers are now closed. These little white soldiers may now have their hands full, catching germs that may find their way into the tissues or blood stream.

When such conditions occur, our first thought is, avoid constipation; for we know a clean colon is nature's first aid in fighting any abnormal condition.

The importance of a clean colon has not received in the past the attention which it deserves.

The muscular fibres of the intestines are circular and longitudinal. In the large intestine the longitudinal fibres are shorter than the tube itself, which length permits the formation of loculi (cavities). These become the seat of

fæcal accumulations. It is undoubtedly a fact that the loculi of the colon may contain small fæcal accumulations which may extend over a considerable period of time.

The most common parts of the colon to become enlarged are the sigmoid flexure and the cæcum (see diagram in beginning of book), but accumulations may occur in any part of the colon. The ascending colon is much more often filled in life than we are led to believe; indeed, it may be said that chronic accumulations are oftener to be found in the ascending than in the descending colon. This is due partly to the fact that the contents of the colon have to rise in opposition to gravity, and partly to the semi-paralyzed condition of the muscular coat of the colon through inactivity. When the accumulations are large, the increased weight of the colon tends to displace it; and if in the transverse colon, that portion may be depressed, even into the pelvis.

The mass may be so enormous as to press upon any organ located in the abdomen, interfering with its functions; thus we may have pressure on the liver that arrests the flow of

bile; or, upon the urinary organs, hindering their functions.

Of course, such excessive accumulations occur only exceptionally, and it is not to these that attention is particularly drawn, because when they are so excessive, a physician should be consulted.

It is to the minor accumulations particularly, that we wish to draw attention—the accumulations that we see in the majority of patients who visit our offices.

Daily movements of the bowels are not always evidence that the colon is not impacted. The diagnosis of fæcal accumulations is facilitated by inquiring as to the color of the daily discharges. A black or a very dark green color almost always indicates that the fæces have remained in the colon for too great a length of time. Prompt discharge of food refuse is indicated by more or less yellow color. In fact every important information of practical significance can be derived from an examination of the fæces, in both their macroscopic and microscopical aspects. We have learned that it is highly important for us to make a

thorough and complete routine stool examination in every case that comes to us for personal treatment.

The attention, therefore, that is given today to bowel elimination is rational and founded on a well-deserved realization of the dangers of constipation. The great difficulty has been not only to increase bowel action but to remove and correct the underlying causes of chronic inertia or fæcal retention.

What We Can Detect From a General Inspection of the Stool.

Normal Feces.

Yellow to dark brown; usually sausage-shaped and definitely formed; soft in consistency; amount in 24 hours varies from 3 to 7 ounces.

Distinctive Feature—Definitely formed.

Acute Enteritis (Diarrhea).

Varies from brown to green, the latter frequent in young children; discharges usually semi-liquid or soup-like; may become watery, and number 6 to 20 in 24 hours.

Distinctive Feature—Semi-Liquid.

Blood from Stomach, Liver or Small Intestine.

Stools containing blood from above colon are black or "tarry" unless evacuations are diarrheal, when blood may be red and fresh.

Distinctive Feature—Black Color.

Blood from Colon or Rectum.

Blood from lower portion of canal is usually bright red and on the surface of the stool. If piles and fissure can be excluded, presence of pus with fresh blood points to cancer.

Distinctive Feature—Fresh Blood.

Jaundice.

Deficiency of bile due to obstruction from catarrhal jaundice or gall-stones produces clay-colored and putty-like stool; markedly greasy or fatty; similar stool may indicate pancreatic disease.

Distinctive Feature—Clay color.

Mucous Colitis (Intestinal Catarrh).

Mucus occurs on stool as grayish white clumps; or it may be expelled as membranous casts, as strings, or as sago-like bodies in masses similar to frog spawn; if very liquid, it may make fæces semi-fluid.

Distinctive Feature—Mucus Present.

What the Microscopical Examination of the Stool Shows.

Meat Diet.

Muscle fibres; connective and epithelial tissue shreds; many putrefactive and other bacteria.

Vegetable Diet.

Vegetable fibres and cells; starch granules; but with putrefactive organisms markedly less than with a meat diet.

Milk Diet.

Marked absence of putrefactive organisms, and food debris, but with harmless milk bacteria in abundance.

Acute Diarrhea.

Contains various fibres and cells of undigested food; some epithelial and tissue shreds; numerous bacteria; mucus shreds; and white and red blood cells.

Mucous Colitis.

Mucus and epithelial shreds; numerous bacteria; undigested food fibres and cells; also white and red blood corpuscles and pus cells.

Amebic Dysentry.

Examination shows epithelial and mucus shreds, with amebae. Numerous blood corpuscles; also various bacteria.

Jaundice.

The microscopic examination of the fæces in jaundice shows fat and oil globules, and tufted crystalline masses of the calcium and magnesium salts of the fatty acids.

PART II.

Rational Hygienic Suggestions.

Fresh air, sunlight, pure water, diet and exercise are the great curative agents provided by Nature, and the physician's aim, no matter to what school he belongs, is to remove as far as possible all existing impediments, and to see that the hygienic conditions are made as favorable as possible. For the rest, Nature, the marvellous builder, will, in her own mysterious way, build up fresh tissue, and slowly but surely, wherever favorable, repair the ravages made by abnormal conditions.

Whether for the preservation of health, or the treatment of constipation, when present, the chief thing is to keep the colon clean.

If the principal drain in a dwelling becomes choked, what is the consequence? The noxious gases generated by the accumulated filth having no outlet, are forced back into the building, making the atmosphere obnoxious to the

inhabitants. Deodorizing and disinfecting will simply be a waste of time and material, until the drain is cleared. The colon is the main drain of the human body, and if it be necessary, for sanitary reasons, to keep the house drains clean, how vitally important is it to keep the main outlet of the physical system free from obstructions.

Or, to use another homely illustration, when your coal stove has been run continuously for a long time, as a natural result it becomes clogged with cinders and ashes, causing the fire to burn badly. You encourage it with fresh fuel, rake it and shake it but without avail—the accumulations of débris are too great. You remove a portion, but its place is taken by more substance from above. At length you resort to the measure you should have employed at first—you "dump the grate" and start a fresh fire. The moral is obvious; dump the grate of the human system—in other words, empty the colon.

It has been previously shown that the colon is neither more nor less than a prolific hot-bed for the wholesale breeding of germs—mi-

crobes. Of course, there are harmless micro-organisms as well as hurtful ones; in fact, a large proportion of them are beneficial rather than otherwise; but some of them are so intimately associated with various disorders that it is next to impossible to doubt their responsibility.

If microbes are introduced into the system, either by contact with sick persons, inhaling impure air in crowded public buildings, or breathing in the dust on ill-kept streets, there may be danger ahead; for if the recipient is not in a sound, physical condition, the microbes are apt to multiply, causing disorders in some form.

Of course, every one who breathes in the microbes of some particular disease does not catch it, or we should soon all be dead, but those who have not the resisting power of sound bodies to kill these germs before they have time to set up their peculiar inflammation, are apt to realize the evil effects, a week, a month, or even a year afterwards.

It is evident then that to keep our bodies healthy we must get the system into such a

sound, healthy condition that disease germs cannot obtain a lodgment in it.

It is evident that by thoroughly cleansing the colon, and keeping it absolutely clean, much can be done to keep the body healthy and keep the bad germs out.

The intelligent reader, recognizing the absolute correctness of the foregoing proposition, will naturally ask, "Can such a thing be accomplished, and how?" We beg to assure the reader, most emphatically, that it can, but not by the means usually employed. It is perfectly plain that the cleansing process cannot be effected by cathartics, for at the best, they only afford temporary relief (witness the growth of the cathartic habit), while on an impacted mass such as is commonly present in the colon, the influence they can exert is many times practically *nil.* The common experience of those afflicted with constipation is, that they commence with a laxative, gradually increasing the quantity and frequency of the dose, until it fails to act at all. Then they resort to a cathartic, with a similar experience, when it is exchanged for a more powerful one,

and then for another still more powerful, until at last, it becomes impossible to move the bowels without a powerful dose.

That this is no overdrawn picture many of our readers will bear witness, and our brother practitioners can amply corroborate the statement, for they fully recognize the vital importance of removing the waste from the system.

There is a simple and effective method of dealing with this trouble; of removing the accumulations, no matter how large they may be; of thoroughly cleansing that important organ, the colon, without the least demand upon the vital forces, and that is by

Washing It Out.

In plain English, cleanliness, especially *internal cleanliness,* is our suggestion to attain that condition which we are told is next to godliness, there is nothing equal to water—especially "hot water."

Strange, that such an obviously commonsense proceeding has not become more universal.

This method of internal cleansing is in

reality of ancient origin, as we have it on good authority that it was practised by the ancient Egyptians, who, it is believed, acquired their knowledge from observing a bird called the Ibis, a species of snipe. The food of this bird, gathered on the banks of the Nile, was of a very constipating character, and it was observed, by the earliest naturalists, to suck up the water of the river and using its long bill for a syringe, inject it into its anus, thus relieving itself. Pliny says this habit of the Ibis first suggested the use of enemas to the ancient Egyptian doctors, known to be the first medical practitioners of any nation, not excepting the Chinese. [See Naturalis Historia, Lib. VIII., Dap. 41, Hague 1518.]

Another writer, viz., Christianus Langius, says that this bird, when attacked with constipation, at some distance from the river, and not able to fly from weakness, would be seen to crawl to the water's edge with drooping wings and there take its rectal treatment, when, in a few minutes, it would fly away in full vigor of regained strength.

The question is often asked, and naturally

so, why this unnatural accumulation is in the colon? The horse and ox promptly obey the call of nature; they know no time or place, and are blessed with clean colons. So are the natives of Africa. But the demands of civilized life insist upon a time and place. Business, etiquette, opportunity, and a thousand and one excuses stand continually in the way, and nature's call is put off to a more convenient season.

How many people are not presentable to themselves or friends, owing to the putrid smell of their bodies, so that in polite society strong colognes and other perfumes are used. Show me a woman who girds her waist with corsets or any tight clothing, and we will warrant you that she can never enjoy perfect health. The special reason for this is, that the lacing comes immediately where the transverse colon crosses her body. Now, if the sigmoid-flexure becomes loaded, because of its folding upon itself, how much more will the transverse colon become clogged if unnaturally folded upon itself by compression from each side folding it, as demonstrated in some instances,

almost double the whole length, into two extra elbows, where it, if natural, is straight.

Many reasons have been given by physiologists and humanitarians why it is injurious for women to lace, but this reason outweighs them all. Wear the clothing loose, clean out the colon and heal it up, and life will be a continual blessing; for, if the main sewer of the body is closed or clogged, nature has but three other outlets; the capillaries or pores of the skin, the lungs in exhalation, or the kidneys. If the colon is clogged, the other outlets will be overworked and an unhealthy body may be the result.

The condition of the colon (the physiological sewer) having been demonstrated, does it need any argument to convince the intelligent thinker that the most rational and practical manner of dealing with this hot-bed of filth is to wash it out?

With us, it has passed beyond the theoretical stage, for we have in our office fully 15,000 letters from grateful patients who have used this process, under our direction, with the most astounding results; while tens of thousands of

gratifying messages have reached us from time to time; nor is the testimony in its favor confined to the laity, for hundreds of physicians (including some of the most prominent authorities) testify to the wonderfully beneficial results achieved by its use.

We now come to the most important feature of the subject—the means for putting it into practice, for it will readily be admitted that such an admirable and common-sense method of cleansing should have the most perfect means procurable for its application, but until the present time the available means have remained crude and undeveloped.

The most effective method of irrigating and cleansing the colon is the "J. B. L. Cascade," a mechanical appliance invented and perfected by the author, which completely rids the process of injection of all its objectionable features, and enables young and old, weak and strong, to use the treatment. It achieves the desired result far more effectively than any other known apparatus, with the least possible inconvenience to the patient, and yet so gently and easily that the operation, so far from be-

ing distressing or disagreeable, becomes a positive gratification.

One of the gravest objections to all the hitherto existing appliances was the construction of the nozzle, or tube, that is inserted in the body, and through which the water is conveyed. These are all (without exception) made with an aperture in the end, or extreme tip, the consequence being that a small jet of water is continuously directed upon one spot in the delicate and sensitive mucous membrane. With water at the necessary temperature this is a source of grave danger, and likely to result in serious injury. For little slits occur in the rectal lining, in which fæcal matter lodges, ultimately forming what are known as pockets, causing, first, irritation, then inflammation, and, finally, "proctitis"—chronic inflammation of the intestinal canal. The best authorities agree in condemning the direct jet, while rectal specialists regard it as one of their chief aids to income.

With these facts in view, the construction of our "injection point," or entering tube, engaged our special attention, finally, with the

result that a most successful means of overcoming this dangerous objection has been provided. Instead of the opening in the end, the tip is made absolutely solid, so that the impact of the entering water is not felt at all, while it is provided with six rows of perforations on the sides, through which the water is evenly diffused over the walls of the rectum, which is a most desirable thing in cases of rectal inflammation. It is also so constructed that the natural constriction of the sphincter muscles holds it firmly in position in the rectum, and while affording the water free passage into the colon, it prevents the escape of the fluid externally, thus rendering soiled garments impossible.

But the simplicity of the operation is one of its chief advantages, for the patient sits upon the appliance in ease and comfort while receiving the cleansing stream, and by following the directions the time occupied in the operation need not exceed fifteen minutes. The faucet is considered by experts as a most valuable feature, on account of the "dome" portion, which accurately fits the natural arch

formed by the limbs when the body is in the seated position.

Many people are accustomed to use the bulb and fountain syringes in a reclining position, and some physicians recommend the patient to kneel in the bath tub, with the body bent well forward; an irksome, disagreeable position. The theory is, that the water will flow into the body by gravitation, but they overlook the fact that the ascending and descending portions of the colon, being parallel in the body, the water, while flowing readily into the descending portions, would have to flow uphill in the ascending portions and by the time it reached there, the force would be exhausted.

The weight of the body furnishes greater force, which is proportioned to the size and bulk of the patient, but is not perceptible to him, on account of the solid construction of the tip of the "injection point," while the steady, uniform pressure exerted serves to distend the walls of the colon and thus liberates adherent matter. The great majority of people, however, use these crude appliances while seated over a vessel, which is decidedly injurious. By

reference to the diagram of the digestive organs it will be seen that the "descending colon," that portion which terminates in the rectum, is larger than either of the other divisions of that organ. In fact, its capacity (in the average adult) is about three pints, equivalent to three pounds. Now this weight, in a flexible organ like the colon, must cause a sagging down, exerting a serious strain upon its attachments to the abdominal wall, and by its pressure upon the sphincters will induce prolapse of the rectum. That is one reason why so many people find it almost impossible to receive enough water to make the treatment successful. When a physician, or trained nurse, is administering a high enema, it is a common practice to hold a folded towel against the rectum, to guard against this pressure and its possible results. The "dome" portion of the faucet (previously referred to) affords the desired support, automatically and effectually prevents any prolapse; while the handle of the faucet, projecting forward, between the limbs, may be manipulated with the greatest ease in controlling the flow of water; and, being

seated on a warm cushion, the patient experiences a pleasant, soothing sensation, which completely allays any nervousness.

The Cleansing Tonic should always be used as directed. The ingredients first act as a decided aid in loosening up the fæcal matter from the walls of the colon and then, when removed, the lining of the colon is clean and free to function as nature intended. This Cleansing Tonic is merely added to the water used in the Cascade. It is perfectly harmless, even though a hundred times the necessary quantity should be forced into the intestinal canal. The Cleansing Tonic is not alone a cleaning agent, for it possesses admirable tonic properties, which act upon the muscular coat of the colon and aid in securing its more normal action.

Defecation, or the expulsion of waste substance from the bowel, is accompanied by the contraction of the circular fibres of the said muscular coat, but when constipation has existed for any length of time, the accumulated matter adhering to the walls of the colon renders that organ partially rigid, hence the diffi-

culty of evacuation; consequently, through disuse, the muscles become to a certain extent atrophied, and require stimulation to resume their natural function even after the colon has been cleansed. It is largely owing to the use of this Cleansing Tonic that the "Cascade" has been so successful in cases of obstinate constipation, as by its use the intestine regains tone and power, and the parts are strengthened.

We unhesitatingly assert that if the colon be regularly cleansed by this means, bacteria and products of decomposition are expelled, thus eliminating one of the grave dangers and giving a quick relief that is so desired by all who feel the need of bowel action.

NOTE.

If the water is not readily expelled do not attempt to force it out by straining. Instead, flatten in the abdomen by forcibly contracting the abdominal muscles.

PART III.

How to Use It.

Having thoroughly cleansed the reservoir, the faucet should be shut off, a level tablespoonful of the Cleansing Tonic dissolved in a little warm water in a cup or glass and poured into the reservoir, which should then be completely filled with water as hot as the hand can comfortably bear; not to simply dip the fingers in and withdraw them, but so that you can immerse the hand and allow it to remain without discomfort. If tested with a thermometer the water should be from 100 to 105 degrees Fahr. Hot water is the best solvent for impacted fæcal matter, and, on the other hand, water below the temperature of the body may sometimes cause pain.

It is necessary that the reservoir should be absolutely full to insure the exclusion of air, as

its presence is likely to prevent the proper reception of the water.

For this reason it is advisable to solicit the bowels before taking the treatment, as, if even no fæcal matter is expelled, pent-up gases are frequently liberated.

The reservoir having been filled as directed, the "Cascade" should be laid down and the "injection point" screwed in. It is then ready for use. Being all ready, spread a small quantity of the J. B. L. Lubricant on the point. This is simply to lubricate the passage and facilitate the admission of the "injection point." Then, standing in front of the seat on which the "Cascade" is lying (as if preparing to sit down), pass the left hand between the lower limbs and grasp the handle of the faucet, to guide the "injection point" into the rectum, and then carefully sit down upon the "Cascade." When the "injection point" has been completely introduced and you are comfortably seated, relax the muscles and allow the whole weight of the body to rest freely on the "Cascade," and turn on the faucet, partially

at first, then after a few seconds, turn it on fully and you will readily receive the water.

The most convenient place to use the "Cascade" is in the bathroom, placing it on the closet seat, or any firm seat, such as a wooden-seated chair. But take care to have a vessel at hand in which to discharge the contents of the bowel.

As soon as the faucet is turned on and the water begins to flow into the body, proceed with the following movements: Commencing in the right groin, stroke firmly but gently, right across the pelvis, or lower edge of the abdomen, to the left groin, then directly upward with the hands to a point just above the umbilicus, or navel, then straight across the body and down to the right groin. These movements are directly over and along the course of the colon, and if they are made gently but firmly, the water will be assisted on its course. A study of the diagram of the digestive apparatus at the commencement of the book will be of great assistance in enabling you to understand the reason for and the method of these movements.

It sometimes happens that after a small quantity of water has been injected there is a strong desire to expel it, which is sometimes due to nervousness, induced by the novelty of the operation. If this be so, shut off the faucet at once and resist the inclination, when, in a few moments, the desire will have passed away, then turn on the faucet again. Be sure to allow the full weight of the body to rest on the "Cascade," and have no fear. It is the weight of the body itself that furnishes the motive power, and to ease up the pressure defeats the object.

As soon as all the water has entered that you feel is possible to receive, turn off the faucet, rise from the "Cascade," sit over the closet, or vessel, and allow the contents of the bowel to escape. At the same time repeat the stroking movement previously described, but this time reverse it, commencing in the right groin, up, across and down to the left groin. These movements have a three-fold object; they assist the water in its passage backward and forward, thus shortening the time of the treatment; they force along the accumulated matter

in the colon with the current of water, and help to dislodge adherent matter from the walls of the colon.

As we proceed on the assumption that the colon is more or less impacted (which experience shows), we do not anticipate that more than two quarts will be received at the first treatment, but as the accumulations are removed by successive treatments, the capacity of the colon is increased, so that at the end of the second week enough should be received to completely fill the colon. The amount of water varies, of course, with the bulk of the individual, but the capacity of the colon, in the average well-grown adult, is about four quarts, but even in the case of a person below the average size, it may safely be assumed that three quarts of water are really necessary for a successful treatment.

Whenever pain is present during the treatment it is usually due to one of two things; either the water has not been sufficiently hot, or the reservoir has not been completely filled, but, if in spite of these precautions, pain should be present, it will be found advisable,

after a small quantity of water has been injected (say from a pint to a quart) to shut off the faucet, rise from the "Cascade" and expel it; then, upon returning to the "Cascade," it will usually be found that the cleansing of the lower portions of the bowel has removed the trouble. The same method of procedure holds good when there is any difficulty in injecting the water. In cases where pain is persistent, even though all precautions are taken (although such are extremely rare), a decoction of anise seed, made by steeping a tablespoonful of the seed in a pint of boiling water, added to the water used for flushing (omitting the Cleansing Tonic), will act as an anodyne on the intestine, aiding in subduing pain.

The frequency with which the treatment is used will depend upon the nature of the trouble and the length of time it has existed. In the great majority of cases it is recommended to be used as follows when commencing the treatment: The first week use it every night; the second week every alternate night; after that use it twice a week, or as occasion seems to demand it. For the simple preservation of

health, twice a week will be found amply sufficient. After using the "Cascade" it will be found extremely beneficial to inject from a half pint to a pint of cool water and retain it. This will be found not only a valuable rectal tonic, but an excellent diuretic as well, as it will pass off by way of the kidneys, cleansing and purifying those organs.

The "Cascade" should not be used within three hours after eating a full meal, as, if both the stomach and transverse colon are distended at the same time they press upon each other, and the stomach, being the more sensitive of the two, nausea is likely to be produced; but although (with the above proviso) the treatment can be used with benefit at any period during the twenty-four hours, yet, just before retiring at night is by far the best time to take it, for several reasons. Firstly, it is usually the most convenient time for the majority of people. Secondly, it invariably induces a good night's rest; for no sleeping potion can equal its effects in that direction. Thirdly, night is Nature's repairing season, when she is busy making good the ravages of

the day—replacing the waste by building fresh tissue and by putting the system into a cleanly condition and purifying the blood current; at that season you are co-operating with Nature and may confidently expect, and will undoubtedly secure, the best results.

After using the "Cascade" it is quite possible that there may not be a movement of the bowels until late the following day. This must not be considered as evidence of constipation, but simply a lack of matter to discharge. In a perfectly natural condition of existence there should be at least two movements of the bowels during the day, but it must be remembered that the human system has acquired bad habits, and it will require some time before perfect conditions are re-established. If, however, from a half pint to a pint of hot salt water (teaspoon of salt to one pint of water) is sipped in the morning, a half hour before breakfast, it will stimulate the bowels to action, even though the "Cascade" had been used the night before, while its cleansing effect upon the stomach will assist the digestive functions in a marked degree.

* * * * *

It may be accepted as a truism that success invariably excites envy, therefore, it is but reasonable that the astounding results that have attended this method of cleansing should have aroused a certain amount of antagonism. The hardy individual who dares to propose a new departure in the method of cleansing the colon must be prepared to hear his theories ridiculed, his system denounced, and, possibly, his motives impugned. Consequently, it is not surprising that the "Cascade" has some objections urged against it.

The first objection we are confronted with is, "it is not natural." We willingly concede that point, and will add that neither is an obstructed and engorged colon natural.

We are living (in a large measure) an artificial life. In his barbaric state man obeyed the calls of nature without regard to time or place, and it is safe to assert that under those conditions an obstructed colon was an unknown quantity. But in deference to the demands of civilized life we disregard Nature's calls and defer the response until a convenient

opportunity presents itself, and for this violation of natural law a penalty is inflicted.

An obstructed colon, therefore, being itself unnatural, man is obviously justified in using the brains that Nature has endowed him with to cleanse it. An artificial limb is unnatural, but would the same objection hold good that because a man has had the misfortune to suffer amputation, he must, therefore, limp through life on crutches, rather than use the mechanical substitute that man's ingenuity has devised?

Common sense teaches us, and experience has amply confirmed the teaching, that flushing is not only the easiest, but the most effectual means of accomplishing this purpose; and it is unmistakably the most harmless, inasmuch as we use Nature's most simple and effective cleansing agency in the process—pure water. Sickness is in itself unnatural, and until the system can be restored to its natural condition reason plainly shows us that we must cooperate with Nature and assist in removing these impurities from the system, a task which our disregard of her warnings has prevented her

from accomplishing. Cathartics simply excite the excretory processes, and stimulate Nature to a violent effort to expel them, the unnatural exertion being followed by a feeling of languor, for all purgative action is debilitating. Flushing, on the contrary, acts directly on the accumulated matter in the colon (which cathartics never do), and, instead of causing an unnatural excitation of any of the natural processes, it induces a calm, restful feeling and a sense of profound relief.

"It is a debilitating practice," the objectors urge. Here, again, we join issue. We are in a position to prove a decided negative.

We have the evidence of thousands of people to the contrary—people who have tested the treatment, and, setting aside the weight of testimony, even the most prejudiced mind must admit, that actual, *personal* experience is more to be relied on than unsupported theory.

Dr. Forrest said that his patients who had used the treatment for months, and even years, had steadily gained in strength and flesh all the time.

Another favorite objection is that "it causes

the intestines to become weakened and dependent upon this unnatural method." To this we reply that it is a well-known fact that at least fifty per cent. of people in civilized (?) communities are slaves to the purgative habit, the system refusing to fulfill its functions without this unnatural excitation; therefore, if dependence must be placed in something, we should unhesitatingly give the preference to water, as against cathartics, but the whole weight of evidence shows that the objection has no foundation in fact.

On this subject Dr. Forrest said: "Flushing the colon does not cause weakening of the intestines. When this procedure is no longer necessary, owing to better physical conditions, the intestines have also been strengthened and improved in tone and will carry on their functions unaided."

Dr. Stevens, who has used the treatment upon himself and patients for over twenty years, says that it in no wise interferes in his case with the normal movement of the bowels. To test it in this respect he has frequently discontinued its use for a week, with the result

of a regular movement, as soon as enough fæcal matter had accumulated to demand it.

For over twenty years he has practiced flushing upon himself, and, although now between seventy and eighty years old, since beginning its use he has never known a day of sickness.

It is contended by some people, including a percentage of physicians, that the frequent use of this treatment will so stretch the colon that it will remain permanently distended. This argument is totally opposed to physiological law, to say nothing of experience and common sense. The veriest tyro in the matter of exercise knows that exercise develops a muscle; that repeated flexion and extension of the arm, for instance, will strengthen the muscles of that limb, not cause them to lose their contractibility. All muscle fibres are alike in structure, except that some are voluntary, others involuntary, but that difference is simply due to the difference in the source of nerve supply. There is no reason that can be shown why the muscles of the colon should lose their elasticity through exercise in contra-distinc-

tion to all the other muscles of the body, since they are not subjected to any extraordinary strain, the extreme tension only lasting for a few seconds, while as soon as the water commences to escape, relaxation follows, and, in addition, heat acts as a stimulant. The objection does not even merit serious consideration.

"It operates against peristalsis," (contracting wave), we are told. We deny it, for the energy evinced by the intestine in expelling the water is proof of increased peristaltic vigor, if it is proof of anything. And even if it did suspend peristalsis for a few minutes, is it not a fact that other natural functions can be suspended for a much longer period, only to be resumed with unabated vigor?

Equally absurd, and destitute of foundation, in fact, is the objection frequently advanced that the washing of the interior surface of the colon is injurious; as it washes away the fluid that Nature secretes for the purpose of this lubrication.

Does bathing the external surface of the body prevent the further excretion of perspiration; or bathing the eyes destroy the functions

of the Meibomian glands? Does the drinking of water prevent any further discharge of saliva into the mouth, or of gastric juice into the stomach? If the washing away of a secretion destroyed the power of the secreting gland, human existence would be brief indeed.

The truth is, that not one in ten thousand has any practical knowledge of the subject. They may possess a smattering, and in the endeavor to make it show to advantage, they draw upon their imagination to supply the deficiency. On the other hand, we have been making this subject a constant study for the past thirty-two years, having had experience in thousands of cases, and therefore, contend that our opinion is of more value and is at least entitled to respectful consideration.

Whether the practice of the treatment is to be persisted in will, of course, depend upon the nature and habits of the patient. If the pernicious habits that caused the trouble are not abandoned, a constant resort to the treatment will be necessary. If the patient is naturally of a costive habit, and has thoroughly weakened his intestines by a reckless and indiscrim-

inate use of cathartics, it will require a long persistence in reformed habits before the weakened bowels will have gained sufficient strength to fulfil their functions normally.

It is advisable for elderly people to use it more or less continuously throughout life, for with advancing years the bowels naturally become less active, and this simple process offers a valuable means of assistance to flagging nature at the cost of little, if any, exertion; in fact, after a little experience no more will be thought of using the "Cascade" than of taking a meal.

We would strictly impress on the minds of those who propose to give this treatment a trial that, like every other undertaking in life, thoroughness and persistence are absolutely indispensable to success. No great end was ever yet achieved except by hard work, conscientiousness and perseverance, and these three factors are in the highest degree necessary to restore a condition from which it has long been estranged.

If it were a question of large pecuniary profit to the patient, it is scarcely necessary

to say that every nerve would be strained to its utmost tension to bring the coveted prize within his grasp; yet here the reward is of infinitely greater value, a prize compared with which riches are as dross in comparison with gold. It is Health, without which the acquisition of Wealth, is well-nigh impossible, and its possession as profitless to the possessor as Dead Sea fruit.

"Heaven fights on the side of the strongest battalions," is a military aphorism, and Nature ranges herself on the side of the individual who co-operates with her most faithfully, who, in the struggle for existence, brings the greatest amount of determination and perseverance to the encounter.

Perseverance in the treatment will achieve results that seem little short of miraculous to those accustomed to the "hit or miss" methods that have so long been in use. And, best of all, the benefit attained will be permanent, for the system being thoroughly cleansed, so that after a year's conscientious use the person practising it will be repaid a thousand times.

In dealing with the subject of constipation,

which is the most prevalent of all disorders of the body, and is, in fact, the fundamental cause of a great many human ills: the importance of drinking freely of water, from one to two hours after eating a meal, cannot be over-estimated, and most essential of all is the glass of water, half an hour before breakfast. If the digestion is faulty, the morning glass should be hot and sipped slowly.

PART IV.

Practical Hygiene.

There is no logical reason why any human being should die before eighty at least. With proper care the century mark should be reached in many cases. This may sound like an extravagant assertion, but it is absolutely true. It all depends upon taking care of the human machine. Ask an engineer how long a locomotive would last if drawn at express speed every day, or if left standing idly on a siding! He will tell you that overwork or disuse are fatal to mechanism, so far as its capacity for lasting is concerned. Well, the most finished product of man's handiwork in machinery cannot begin to compare with that wonderful, complex piece of mechanism—the human body; and if care will prolong the life

of the lifeless machine, the veriest dullard cannot fail to perceive that the same rule applies with ten-fold force to the human organism, which possesses within itself the power of recuperation—a living machine, every atom of which is being daily replaced as fast as the friction of life disintegrates.

If the locomotive were capable of being reproduced in like manner—of having the daily waste of substance replaced during rest by proper attention to its needs—do you think its owners would ever allow it to wear or rust out? Would they not bend every energy to prolong its existence indefinitely? Most assuredly they would. And is the body, the earthly habitation of the real man, of less importance to himself than the creations of his own hands? Common sense says, "No!" But daily experience shows us that the bulk of humanity are far less careful of the earthly husk that shelters the divine *ego* than of the machinery that ministers to their wants. We repeat, there is no logical reason why man should not live to be a hundred, or even more, if only proper care be exercised. The hurry of modern life is fatal

to the expectation of longevity, so also is over-indulgence in the pleasures of the table, which is one of the besetting sins of the present generation. If from childhood the care of the human body was made the subject of constant instruction, the second generation from now would see such a marked change in the personnel of the race as would astound even the most sanguine. What if a few less dollars were piled on each other? Which is the more to be desired, a perfect, healthful physique, or a full purse?

To preserve the body in health is an easy matter, if the individual will only bring the same thoughtful intelligence to bear on the subject that he does on the ordinary affairs of life. The natural agencies for the preservation of health are, as previously stated, Pure Water, Sunlight, Fresh Air, Diet and Exercise. The first three are furnished "without money and without price" by the all-wise Mother, while the two last simply require a slight exertion of will power, tempered with intelligence.

Of the quintette of agencies mentioned

above, water is one of the most important. Water enters more largely into the composition of all organic substance than the majority of people dream of, and this is notably true of the human body. Few people realize that sixty-six per cent. of their earthly tenement consists of the fluid in which they perform their ablutions, yet such is the fact.

This important physiological truth should be carefully laid to heart, for it accentuates the vital necessity of imbibing a sufficient quantity of fluid daily to preserve the proportion in the system requisite for health. Water is the only known substance that possesses the power of permeating every cell and fibre of the living organism, without creating disturbance or irritation. Water is, in fact, an indispensable necessity for physical existence—its excess or deficit creating abnormal conditions; but the latter is the more common condition. Being universally present in all tissues of the body, water is the principal agent in the elimination of waste material from the body, according to Nature's plan—hence, for the preservation of health, every adult should drink from two to

three quarts of water per day, certainly not less than two quarts. One of the remedial factors in the copious use of water in "flushing the colon" is that a liberal percentage of it is absorbed through the walls of the colon, directly into the circulation, thus increasing the amount in the tissues, and causing more fluid to pass through the kidneys—cleansing them.

Hot water used as a stomach bath (see page 145) is a valuable auxiliary in the preservation of health.

By its means the stomach is cleansed of mucous accumulations and particles of undigested food, thus enabling it to perform its functions satisfactorily. If, as is often the case undigested food remains in the stomach, it ferments, causing what is known as sour stomach. By regular flushing, the digestive fluids are free to act better on the new intake of food and thus materially aid digestion.

With the body externally and internally in a clean condition, sickness is less apt to occur. But there are external applications of water, which are equally important for the preserva-

tion of health, and first and foremost is the bath.

It is a matter of authentic history that the most highly enlightened and prosperous people of the world have been celebrated for their devotion to the bath as a means of securing health and vigor—as a means of curing disease, and preventing it, by promoting the activity of the skin. The excavations at Pompeii show the devotion of the people to luxurious bathing. The Romans are famous to this day for the magnificence of their lavatories and the universal use of them by the rich and poor alike.

Most people are familiar with the aphorism, "cleanliness is next to godliness," a statement that by implication relegates cleanliness to the second place, but we would transpose this stated sequence of conditions, and assign the premier position to cleanliness; for we contend that purity of soul presupposes purity of body. It is true that we sometimes find a "jewel in an Ethiop's ear," but it is the exception that proves the rule.

But it is not from the moral standpoint that

we wish to consider the subject of physical cleanliness, but from the hygienic. How few people there are who are *really* physically clean! The outward semblance of cleanliness too frequently poses as the real article.

Among the white races of the earth, the English are the greatest devotees of the daily tub, to which custom their ruddy complexions are largely due; but Japan is pre-eminently in the lead in the matter of daily bathing, for it is doubtful if there could be found in the land of the "little brown people" a single individual who does not bathe the whole body daily, unless physically incapacitated.

The skin is such an important excretory organ that the importance of keeping its innumerable infinitesimal outlets free from obstruction cannot be overestimated. As the structure of the skin may not be understood by the average reader, we will briefly describe this wonderful depurating organ, that the paramount importance of its functions may be properly appreciated.

The skin consists of two layers, the derma, or true skin, and the epidermis, or cuticle. It

is the principal seat of the sense of touch, and on the surface of the upper layer are the sensitive papillæ, which receive and respond to impressions; and within, or imbedded beneath it, are organs with special functions, viz., the sweat glands, hair follicles and sebaceous glands. Its value as a means of depuration is incalculable, as by it vast quantities of the aqueous and gaseous refuse matter is conveyed from the body. By the aid of a four diameter magnifying glass applied to the skin of the palm of the hand, the curiously inclined will observe that it is divided into fine ridges, which are punctured regularly with minute holes. These are the mouths of the sweat glands, and generally known as the pores of the skin. Their function is to bring moisture to the surface of the skin; which is secreted from the blood, and chemical analysis reveals the fact that this moisture is always more or less loaded with worn-out and effete matter. It is estimated that there are 3,800 of these glands in each square inch of skin, and that their total length, in an ordinary person, if placed end to end, would be ten miles. Then there are the

sebaceous, or oil glands, which oil the skin and keep it flexible. Now, as the process of destruction and upbuilding is perpetually going on in the body, and the skin being one of the principal avenues by which the refuse is removed, the vital necessity of keeping this organ perfectly clean becomes apparent at once; for this refuse matter, if retained in the system, acts as a poison, and furnishes food for disease germs to feed upon.

It has been demonstrated by experiment upon dogs from which the hair had been shorn that a coat of varnish applied to the body (thus effectually closing the pores), will cause death in a very short while. No better object lesson could be given of the imperative necessity of keeping the skin perfectly clean, if you wish to enjoy good health.

It is an easy matter to keep all these miles of tubing in a perfectly natural and active condition, by a strict observance of the fundamental principle—cleanliness. Bathe the body daily, complete, immersion, if practicable; if this is not possible, then sponge the body thoroughly, all over; but if both methods are ren-

dered out of the question by circumstances, then adopt the best substitute, namely, vigorous friction with a coarse towel.

As to the temperature of the bath, that must, to a great extent, depend upon the conditions of life, and the predisposition and susceptibility of the individual; but the cold bath should always be employed in preference to the warm bath, when conditions permit. The cold bath is a powerful stimulant to the sympathetic nervous system, and as that is the great regulator of nutrition, the value of cold bathing to those afflicted with digestive disturbances will be readily understood, since all the digestive and assimilative processes are quickened by it. The glands of the stomach secrete more hydrochloric acid on account of this stimulus, and a better quality of gastric juice being thus formed, not only is the digestion improved, but the system is better enabled to resist microbic invasion. The cold bath also stimulates the vaso-motor system, which regulates the circulation, by contracting and dilating the vessels, and increases the activity of the capillaries, or small blood vessels. It thus increases

the resisting power of the skin, by enabling it to reheat the surface after a chill, and this is the reason why people who habitually use the cold bath are practically proof against "colds."

People employed in sedentary occupations are especially benefited by the cold bath, but should employ a hot bath for three or four minutes beforehand. It is also especially beneficial to women, as, being an excellent nerve tonic, it successfully combats all forms of nervous weakness, and is an admirable preventative of hysteria.

Children under seven years of age do not bear the application of cold water very well, and it is advisable not to use the water at a lower temperature than 70° Fah., and to employ friction constantly while administering it; but after that age the temperature may be gradually lowered. In old age the neutral bath, from 75 to 80° Fahr., will be found the best for general use, accompanied by friction.

The bath, to be thoroughly beneficial, should be taken at one of the three following portions of the day: immediately upon rising, about ten o'clock, or just before going to bed. The

early morning bath is, however, immeasurably the best, and if cold, will be found a wonderful aid in promoting health and vigor, and being such a necessity, especially in the preservation of health, and the constant practice of it, strongly urged, we append the following useful suggestions for guidance:

A full meal should not be taken in less than half an hour after bathing. Nor should a bath be taken in less than an hour and a half after eating a full meal.

You can bathe with impunity in cold water when the body is perspiring freely, as long as the breathing is not disturbed, nor the body exhausted by over-exertion.

Never bathe in cool or cold water when the body is cold. First restore warmth by exercise.

Always wet the head before taking a plunge bath, and the chest also, if the lungs are weak.

In case of sickness, where it becomes necessary to assist Nature in ridding the system of impurities through the medium of the sweat glands, the "wet sheet pack" will be found invaluable. It is usually regarded by those im-

perfectly acquainted with its action as simply the chief factor in a sweating process, but it is more than that. Not only does it open up the pores and soften the scales of the skin, but it "draws" the morbid matter from the interior of the body, through the surface to the pores. It is of immense value in all cases of fever, especially bilious fever.

It should be born in mind that "flushing the colon" should always precede the use of the "pack."

If any one doubts the purifying efficacy of this process he can have a "demonstration strong" by the following experiment: Take any man in apparently fair health, who is not accustomed to daily bathing, but who lives at a first-class hotel, takes a bottle of wine at dinner, a glass of brandy and water occasionally, and smokes from three to six cigars per day. Put him in a pack and let him soak one or two hours. On taking him out the intolerable stench will convince all persons present that his blood and secretions were exceedingly befouled, and that a process of depuration is going on rapidly.

Full directions for the use of the pack will be found at the end of this work.

It will be necessary to take into consideration the vitality of the patient and regulate the temperature of the sheet accordingly. The best time to use it is about ten in the morning, or nine in the evening.

The Turkish bath (see page 145) is another important factor in treating disease, also the hot foot bath, for all disturbances of the circulation, cramps, spasms and affections of the head and throat. Hot fomentations, which draw the blood to the seat of pain, thereby raising the local temperature and affording relief, and wet bandages for warming and cooling purposes will likewise be found valuable aids.

Humanity at large has never estimated water at its true value, yet all the gifts in Pandora's fable box could never equal that one inestimable boon of the Creator to the human race. Apart from its practical value, there is nothing in all the wide domain of Nature more beautiful, for in all its myriad forms and conditions it appeals equally to the artistic sense. In the restless ocean, now sleeping tranquilly

in opaline beauty beneath the summer sun, now rising in foam-crested mountainous waves beneath the winter's biting blast, its sublimity awes us. In the mighty river, rolling majestically on its tortuous course, impatient to unite itself with mother ocean, its resistless energy fascinates us. In the gigantic iceberg, with its translucent sides of shimmering green, its weird grandeur enthralls us. In the pearly dewdrop, glittering on the trembling leaf, or the hoar frost, sparkling like a wreath of diamonds in the moon's silvery rays; in the brawling mountain torrent, or the gentle brook—meandering peacefully through verdant meadows, in the mighty cataract or the feathery cascade, in the downy snowflake, or the iridescent icicle—in each and all of its many witching forms it is beautiful beyond compare. But its claims to our admiration rest not alone upon its ever varying beauty. When consumed with thirst, what beverage can equal a draught of pure, cold water? In sickness its value is simply incalculable—especially in fevers; in fact, the famous lines of Sir Walter Scott, in

praise of woman, might be justly transposed in favor of water to read thus:

> "When pain and sickness wring the brow,
> A health-restoring medium thou."

And, if we admire it for its beauty and esteem it as a beverage, how inconceivably should these feelings be intensified by the knowledge that its remedial virtues are in nowise inferior to its other qualities!

The next in importance of the great health agencies is Fresh Air. Perhaps we ought to class it as the most important, for although people have been known to live for days without water, but without air their hours would be quickly numbered. Air is a vital necessity to the human organism, and the fresher the better—it cannot be too fresh. The oxygen gas in the air is the vitalizing element. The blood corpuscles, when they enter the lungs through the capillaries, are charged with carbonic acid gas (which is a deadly poison). but when brought into contact with the oxygen, for which they have a wonderful affinity, they immediately absorb it, after ejecting the carbonic acid gas. The oxygen is at once car-

ried to the heart, and by that marvelous pumping machine sent bounding through the arteries to contribute to the animal heat of the body.

When it is taken into account that the lungs of an average sized man contain upwards of six hundred millions of minute air cells, the surface area of which represents many thousands of square feet, the danger of exposing such a vast area of delicate tissue to the action of vitiated air can be readily estimated. No matter how nutritious the food may be that is taken into the stomach, no matter how perfect the processes of digestion and assimilation are, the blood cannot be vitalized without fresh air.

It is estimated that the blood is pumped through the lungs at the rate of eight hundred quarts per hour, and that during that period it rids itself of about thirty quarts of carbonic acid gas, and absorbs about the same amount of oxygen. Think for a moment of the madness of obstructing this interchange of elements which is perpetually going on and on which life depends!

It is more especially during the hours of

sleep that fresh, pure air is needed, for that is when Nature is busiest, repairing and building up, and calls for larger supplies of oxygen to keep up the internal fires, but her efforts at repairing waste are rendered futile if you diminish the supply of the vitalizing element and compel her to use over again the refuse material she has already cast off.

In spite of the amount of literature devoted to sanitary matters, it is astonishing how little is understood of the principles of ventilation, and its supreme importance to the general welfare. We do not, of course, refer to ventilation in its broadest scientific sense, such as the securing of an adequate air supply in large auditoriums, for it is a melancholy fact that even our prominent architects not only display a pitiably deficient grasp of that phase of the subject, but of the simple, yet fundamental principles of the science, which every intelligent adult should be familiar with. How many heads of families, for instance, can intelligently ventilate a sleeping room? It is better to open the window two inches at the botton, and the same distance at the top, than to have it

open for a foot either at the top or bottom only. Considering the length of time that is spent in the sleeping apartment, the paramount importance of a constant supply of fresh air is readily perceived. No matter how perfect digestion and assimilation may be, if the blood is not thoroughly oxygenated, the best of foods fail of their intended effect. Even the least fastidious would object to drinking water that had been used for washing purposes by others; yet it is quite as objectionable to breathe air that is charged with the waste products of bodies that may even be diseased.

Better let in cold air and put on more bedclothes, as long as you do not sleep in a draught.

Oxygen keeps up the animal heat of the body, and you can really keep warmer in a room with plenty of fresh air than in a close room where the air is vitiated.

But in the sick room fresh air is of paramount importance, not only for the patient, but for the attendants, who are otherwise com-

pelled to inhale the poisonous exhalations from the diseased body.

Let no consideration blind you, either in sickness or in health, to the imperative necessity of plenty of fresh air.

The next great natural agency, and one to which scant attention is paid, compared with its hygienic importance, is Light, but more especially Sunlight.

Sunlight is the great health-giving agent. The sun is the great source of life. Its rays stimulate the growth of every living organism, and there is no doubt but they exert a chemical action upon living tissue with which we are as yet but imperfectly acquainted. This fact has been recognized of late years, hence our winter resorts are liberally supplied with sun parlors, in which those in quest of health may enjoy the rejuvenating effect of solar heat without exposing themselves to the inclemency of wintry weather. This is a revival of an old Roman custom, for the more opulent of that nation had sun baths on the roofs of their dwellings. Sunshine is as necessary to robust, vigorous health as either air or water. Then seize the

full enjoyment of it whenever opportunity offers! It is a stimulant and tonic that has no superior.

For nervous debility and insomnia the treatment of all others is rest in sunshine. Draw the bed to the window and let the patient lie in the sun for hours. There is no tonic like it—provided the good effects are not neutralized by ill-feeling. To restore a withered arm, a palsied or rheumatic limb, or to bring a case of nervous prostration up speedily, a most efficient part of the treatment would be to expose the limb or the person as many hours to direct sunlight as the day would afford. With weak lungs let the sun fall on the chest for hours. There will be no doubt left in the mind that there is a curative power in the chemical rays of the sun.

Women especially need to make systematic trial of the sun's healing and rejuvenating rays. The woman who wants a cheek like a rose should pull her soft pillows into the window and let the sun blaze first on one cheek and then on the other, and she will gain color warranted not to wash off.

Thus it will be seen that the curative properties of sunlight are in nowise overestimated, but in cases of sickness its beneficial action is purely supplementary. The system must first be thoroughtly cleansed by "flushing the colon," then, the ground work of improvement being laid, Fresh Air and Sunlight will prove themselves worthy and efficient colleagues in the task of restoring health.

Singly, each is of intrinsic value, but inadequate to cope with disease single-handed (although they may mitigate it), but combined they form a Trinity so powerful that disease can never successfully oppose them.

PART V.

Exercise.

Motion is life. The health of both body and mind depend upon it. Inaction means stagnation, a condition fatal to health. Hence the necessity of exercise. As before stated, disuse is as fatal to a piece of machinery as excessive use; in fact, it is far more likely to rust out than to wear out. Activity is essential to life and health, and can never be prejudicial, provided that moderation is observed and the muscular system not strained or overworked.

There are thousands of miles of minute tubing in the human body—the arterioles, veins, capillaries and lympathic vessels. They ramify through every portion of the body tissues, the first carrying the vitalized blood for nourishment of the parts, the second returning the impure blood, charged with the waste of the structures, the third being the intermediate

stage between the first and second, while the fourth and last, the lymphatic vessels, collect the surplus nutrition and return it to the circulation. In addition the lymphatics assist in the conveyance of effete matter. Whenever disease germs are present in the system, they first manifest themselves in the lymph, but this fluid, being densely populated with phagocytes (white blood corpuscles), the microorganisms are speedily destroyed, if the body is in a healthy, vigorous condition.

In view of the vital character of the fluids, activity of motion is indispensable for the best performance of their separate functions, and exercise supplies the desired stimulus. Whenever a muscle is contracted the blood is wholly or partially expelled from it proportionately to the force of the contraction, and in its escape it carries with it the waste material; but as soon as the muscle is relaxed fresh blood from the arterial supply re-enters the structure, bearing fresh nutrition.

By a wise provision of Nature, the amount of nutrition supplied is always in excess of the waste products removed; that is, all things

being equal, so that the more exercise a part is subjected to the more nutrition it receives. This explains the unusual development of certain parts of the body which are called into excessive use in certain occupations.

The reason for this is perfectly simple, and may be expressed in two words—unequal nutrition—for the muscles that are unduly exercised appropriate the nutriment that should be equally distributed, so that the neglected muscles become weakened and stiff. Hence, any system of exercises designated to develop the body should be so arranged as to call into play every muscle in the individual, thus insuring harmonious development in every direction.

Muscular activity has a most beneficial effect upon all the vital processes, digestion, assimilation and nutrition. The digestive powers work more briskly to prepare the needed nourishment, and the blood circulates more rapidly to carry the material for repair to the parts that need it, so that by moderate physical exercise, judiciously distributed, the whole body is built up and strengthened, and the results is a suppleness of frame and a clearness

of head that makes life indeed worth living.

To the invalid it is, of course, idle to talk of active exercise, but there are certain forms of passive exercise accessible to such people. Massage, for instance, which, judiciously administered, will do for the sick, in a modified degree, what active exercise does for the comparatively well. It will stimulate the circulation in the deeper tissues, and set the various fluids of the body moving in a beneficial manner. There is also a mild form of active exercise which may be practised by those who have the misfortune to be confined to bed, and that is by tensing the muscles; such as clenching the hands and contracting the toes, also by gentle contraction of the arms and legs alternately.

But one of the most important factors in quickening and stimulating the movement of the fluids is exercising the lungs, and that can be accomplished with a fair measure of success even by the bed-ridden. Every time the chest cavity is emptied by the expiration of the breath a partial vacuum is created which exerts a tremendous suction power. It is one of

the principal forces concerned in the return of the venous blood to the heart, but it also exerts a like effect upon the lymphatic current, hence deep breathing is a valuable exercise for those unable to take any other.

In commencing the development of the body by any system of physical culture, the first and most important thing to do is to develop the lungs. Good lungs and good digestion go together. Before food can be assimilated it must undergo oxygenation, which is neither more nor less than chemical combustion. For this oxygen is necessary, which, uniting with the carbon of the food, results in oxidation, and as the amount of oxygen inhaled depends upon the capacity of the lungs, it will readily be seen how much depends upon those organs. We cannot inhale too much oxygen, while we can take too much food; therefore, the greater the lung capacity the better the digestion.

How to Exercise the Lungs.

1. When in the open air, walk erect, head up, chin drawn in, shoulders thrown back, thoroughly inflate the lungs and retain the air

for a second or two, then expel it gently. Practice this several times a day, and if your employment keeps you in, make time and go out.

2. The first thing in the morning and the last thing at night, when you have nothing on but your underclothing, stand with your back against the wall and fill the lungs to their ut-

Fig. 1

most capacity, then—retaining the breath—gently tap the chest all over with the open hand. Do this regularly every morning and night, gently at first, but gradually increasing in the length of time for holding the breath and the force of the blows as the lungs grow stronger.

3. Stand upright, heels touching, toes turned out. Place the hands on the hips as in Fig. 1, the fingers resting on the diaphragm, the thumbs in the soft part of the back. Now, inflate the lungs and force the air down into the lower back part of the lungs, forcing out the thumbs. Do this half a dozen times at first, gradually increasing the number. Women seldom use this part of the lungs—tight dresses and corsets prevent them.

4. While in the same position, fill the upper part of the lungs full, then force the air down into the lower part of the lungs and back again by alternately contracting the upper and lower muscles of the chest. Do this repeatedly, for, besides being a good lung developer, it is an excellent exercise for the liver.

5. Stand erect, as in Fig. 2, the arms hanging close by the sides, then slowly raise the arms until they are in the same position as Fig. 2, at the same time gradually taking in a full breath until the lungs are completely filled, then, after holding the breath for a few seconds, gradually lower the arms, at the same time gradually expelling the breath. After

doing this a few times—while the lungs are full—raise and lower the arms several times quickly.

6. Hold the arms straight out (see dotted lines in Fig. 2), then slowly throw them back

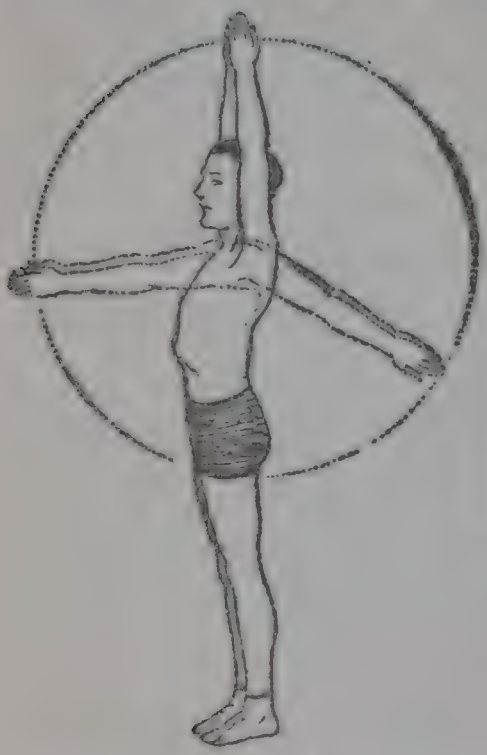

Fig. 2

Fig. 3

behind you as far as possible, at the same time taking a full breath, then bring them slowly back to the front, as at first, expelling the breath while doing so. Do this several times, then fully inflate the lungs, and while holding the breath move the arms backward and

forward, in the same way, but quickly. It is important to inflate and empty the lungs fully and completely during this exercise.

Combination Lung and Muscle Exercises.

7. First rotate the right arm in a circle, as in dotted lines in Fig. 2, downward in front of you a few times, then reverse the movement. Next, thrust the shoulder back as far as it will go and rotate the arm in the same manner. Follow with the left arm in the same manner, then both alternately, but at the same time relax the arms completely, allowing them to become perfectly limp, at the same time filling and emptying the lungs completely.

8. Lie flat on the floor, face downward, with the elbows bent and the palms of the hands flat on the floor by the sides, body fully extended. Then, keeping the body perfectly rigid, raise it up by the muscles of the arms alone, until it only rests on the arms and toes, then lower the body gradually until the chest touches the floor, at the same time exercising the lungs to their fullest extent. This may be practiced on a bed or couch to commence

with, and should be taken slowly at first, until it can be done half a dozen times without discomfort.

9. Stand as in Fig. 3, fill the lungs completely and force the air down into the lower part of the lungs, as in Exercise 3. Then, keeping the lower limbs perfectly stiff, with

Fig. 4

muscles tensed, bend the body forward from the middle of the trunk (see dotted lines in Fig. 3, in front), and while doing this empty the lungs quickly. Then straighten up again, at the same time filling the lungs. This should be repeated from 6 to 12 times. Then repeat the operation, but bending backward instead of forward, paying careful attention to

the emptying and filling of the lungs. Then, with the lungs full and breath retained, move the body backward and forward quickly several times.

10. Retaining the same position as in last exercise, move the upper part of the body to the right a few times, then a few times to the left, after each movement returning to the upright position. Then move in the same manner from right to left, alternately. By referring to Fig. 4, you will readily understand the nature of these movements, which not only benefit the lungs, but impart grace and suppleness to the body.

11. Still retaining the attitude as shown in Fig. 4, press the arms and elbows forward as far as possible, at the same time expelling the breath; then press them backward as far as it is possible to force them, at the same time inflating the lungs to their fullest extent.

Arm and Finger Exercises.

12 Completely relax the muscles of the fingers and hands, letting the hands hang limply from the wrists, then shake them up and down from

side to side, as if cracking a whip. Then rotate them from the wrists, as shown in Fig. 5. These movements should all be made with great rapidity, the hands being rendered as near lifeless as possible.

Next, with the upper part of the arm held out at a right angle from the body, and the forearm hanging downward, completely relax

Fig. 5

the muscles of the elbow. Then shake and rotate the whole of the forearm in the same manner as described for the hands.

Shoulder and Arm Exercises.

13. Allow the arms to hang by the side, now press the right shoulder as far back as it will

go, then as high as it will go, then forward as far as it will go, and drop it again, then rotate it several times. Do the same with the left, then both together. Strike out with the right

Fig. 6

Fig. 7

Fig. 8

hand, tightly clenched, then the left, then both together. Repeat horizontally, right and left, then straight up overhead, then down by the sides.

Exercises for the Neck.

14. If Figures 6, 7 and 8 are carefully studied, no explanation will be needed. The principal thing to be observed is to keep the body perfectly rigid and use the muscles of the neck only. It is a most valuable exercise

and should be carefully and faithfully practiced.

Hip and Leg Exercises.

15. Assume the position indicated in Fig. 4, but keep all the muscles of the body (with

Fig. 9

the exception of the muscles of the hips) perfectly rigid. Now, without bending the knees, bend the body forward as far as you can several times, then backward several times, then to each side successively. Make the bending movements several times in each direction, and

Fig. 10

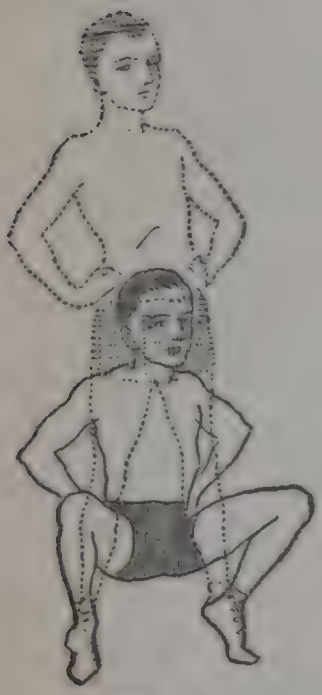

Fig. 11

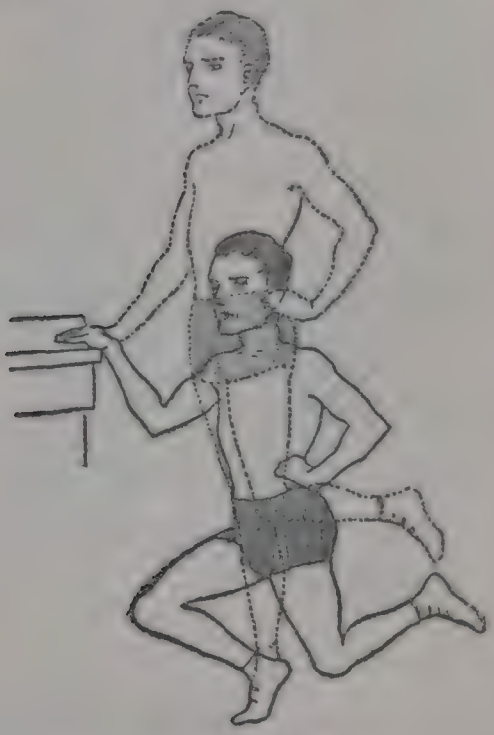

Fig. 12

be careful not to relax the muscles other than those of the hips; and to conclude the exercise rotate the hips round and round.

16. Relax the muscles of the right leg, keeping all the other muscles firmly tensed. Then swing the leg from the hip joint, like a pendulum, backward and forward, as shown in Fig. 9. Try to do this without support, balanced on the one leg, as it materially assists in developing the muscles. Then repeat with the left leg. Next, relax the muscles of the leg from the knee downward, keeping the muscles of the thigh rigid, and swing the leg backward and forward from the knee only (see dotted lines in Fig. 10), and increase the number of movements each day, as the muscles gain strength and you gain experience.

Figures 11 and 12 illustrate some excellent leg exercises, which bring into play certain muscles which usually receive but little exercise, and may be practiced with great advantage.

Ankle and Foot Exercises.

17. Stand upright, holding yourself firmly and stiffly, then raise yourself up and down on your toes.

Whole Body Exercises.

1. Raise the arms above the head, alongside the ears, then bring them down with a steady sweep, without bending the knees, until the fingers touch the floor. Be sure to relax the muscles of the neck and allow the head to hang.

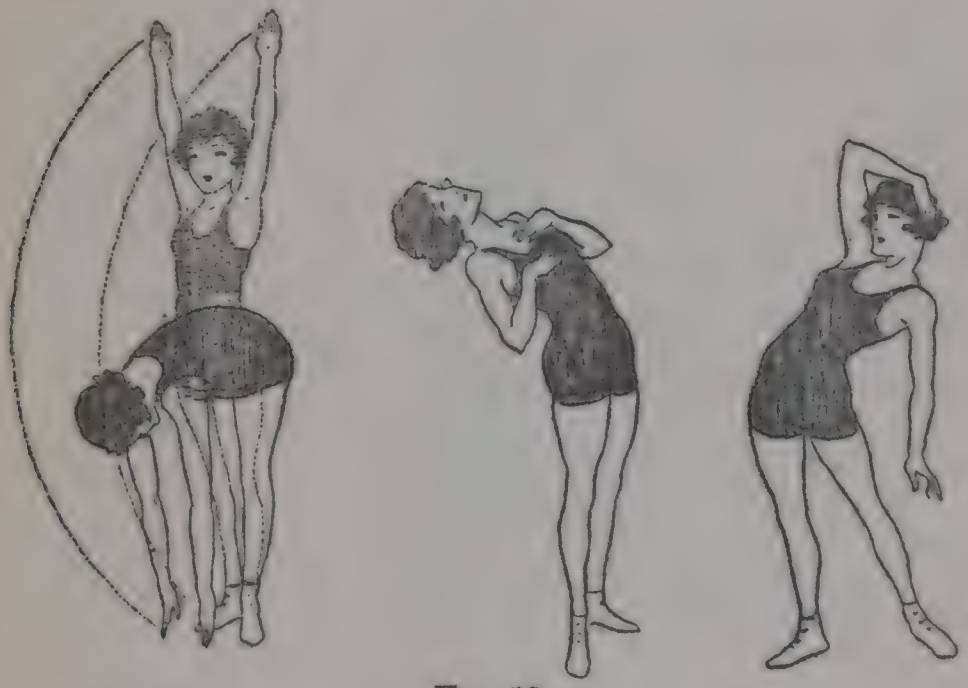

Fig. 13

2. Place the hands upon the breast and drop the head backward, a little to one side, then bend the body backward as far as possible.

3. Curve the right arm above the head, toward the left shoulder, and allow the weight of the body to rest on the left leg, the right foot being carried slightly outward. Allow the body to hang down as far as possible on the left side, without straining too much. Then reverse the movement. (See Fig. 13.)

Stretching.

Is quite a luxury, but few people know how to do it.

Stand in the position indicated in Fig. 14. Then raise yourself on the tips of your toes and try your best to touch the ceiling. You will appreciate this exercise as a relaxation.

Fig. 14

The Art of Standing Properly.

Is only imperfectly understood by the majority of people, and yet it is the key to a graceful carriage, an accomplishment that

most people desire to possess, especially ladies. Figures 15 and 16 will serve to illustrate what is necessary to acquire this art and to emphasize the difference between the correct and the incorrect methods.

Fig. 15

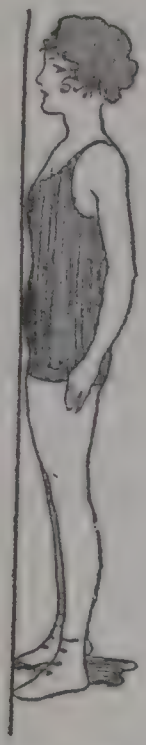

Fig. 16

Fig. 17

In the foregoing list of exercises we have carefully omitted all those requiring apparatus of any kind, selecting only such as can be practiced in the privacy of your own room, with-

out assistance from an instructor or paraphernalia of any kind. Dumb bells, Indian clubs, etc., are valuable after a certain degree of muscular improvement has been attained, but when that point is reached we should advise the individual to join a gymnasium and practice further development under a competent instructor.

All the exercises given have been proven of great value in building up the system, and are designed as aids to the preservation of health and the upbuilding of weakly people—not to develop trained athletes. These exercises bring into play a number of muscles that are not called into general use, and thus promote harmonious development of the whole body.

PART VI.

The Diet Question.

Since an increase in the acidity of the body is recognized as a factor in the causation of many diseases, this table of the foods that increase or decrease body acidity will be found of value.

FOODS THAT PRODUCE ACIDS OR ALKALIES IN THE BODY.

Acid-Producing Foods.

The figures represent the total c.c. of acidity over base.

	Per 100 grams		
Bread	2.7	Meat, chicken	17.01
Bread, whole wheat	3.0	Meat, frog	10.36
Corn	5.95	Meat, pork, lean	11.87
Crackers	7.81	Meat, rabbit	14.80
Cranberries		Meat, veal	13.52
Eggs	11.10	Oysters	30.00
Egg white	5.24	Oatmeal	12.93
Egg yolk	26.69	Peanuts	3.9
Fish, haddock	16.07	Prunes	
Fish, pike	11.81	Rice	8.1
Meat, beef, lean	13.91		

ALKALI-PRODUCING FOODS.

Almonds	12.38	Currants, dried	5.97
Apples	3.76	Lemons	5.45
Asparagus	.81	Lettuce	7.37
Bananas	5.56	Milk, cows'	2.37
Beans, dried	23.87	Muskmelon	7.47
Beans, lima, dried	41.65	Oranges	5.61
Beets	10.86	Peaches	5.04
Cabbage	4.34	Pears, dried	7.07
Carrots	10.82	Potatoes	7.19
Cauliflower	5.33	Radishes	2.87
Celery	7.78	Raisins	23.63
Chestnuts	7.42	Turnips	2.68

As we have already stated, the human system is in a state of constant change. Disintegration of tissue is taking place during every moment of existence, and the preservation of health depends upon the prompt elimination of waste material. But the destruction of tissue, due to the daily friction of life, must be made good, and this replacement of substance is effected by the food we eat. It becomes a matter of individual importance, therefore, to every individual to consider the question of eating from the rational standpoint.

It is a grave mistake to suppose that it is necessary to eat a large quantity of food to become healthy and strong. The system only needs sufficient nourishment to repair the

waste that has taken place. Besides, the digestive fluids are not secreted in an indefinite quantity, but in proportion to the immediate need. Hence, food taken in excess of requirements, being only partially digested, acts as a foreign substance; *i.e.*, a poison, and in addition unduly taxes the system to dispose of the unnecessary waste.

Instead of "eating to live," a large proportion of people simply "live to eat." But sooner or later Nature exacts the penalty for violation of one of her cardinal laws, which is "temperance." An outraged stomach will not always remain quiescent, and when the reaction comes, the offender realizes that "they who sow the wind shall reap the whirlwind."

But people may, and do, continually do violence to the stomach, without being gluttons—we refer to the habit, so universally practiced in this country, of bolting the food without properly masticating it. So long as this iniquitous practice is persisted in, and the equally hurtful one of swallowing large quantities of liquids with the meals, and so long as sufficient time is not given the food to di-

gest, just so long will you suffer from a disordered stomach. It is a fact that the average American considers eating an unprofitable interference with his business, without stopping to weigh the advantages of sound health against the almighty dollar.

Strange, is it not, that a race, proverbial for having an eye to the main chance, should fail to recognize the financial wisdom of husbanding their health, a factor so important in successful business enterprises! They might, with advantage, copy the example of John Bull in the matter of eating.

The average Englishman regards his meals as a solemn responsibility, and tarries long at the table. The consequence is that with them dyspepsia is the exception and not, as with Americans, the rule.

What to eat, when to eat and how to eat are questions more nearly involving the health and happiness of humanity than is generally recognized.

What to Eat.

From the days of Pythagoras down to the present time it has been a moot question

whether a vegetable or meat diet was best for man. Each side can present equally strong arguments; each can point to exceptional instances of physical development under the different methods; each can point to ill results that follow rigid adherence to one method or the other, so that the natural inference would be that a happy mean between the two extremes presents the only rational solution of the question.

Even the most rabid partisan of the meat diet will readily admit that the flesh of animals is not indispensable to existence; while, on the other hand, the fact that the Indians in this country would subsist for months (without apparent discomfort) solely upon a diet of "pemmican" (dried buffalo flesh) affords ample proof that a meat diet is not without its advantages.

Diet is largely a matter of latitude. The whale blubber diet of the Esquimaux would be impossible at the equator, while the fruit and vegetable diet of the tropics would prove totally inadequate to support life at the North Pole. Nature always prompts the individual

to select the articles of food best adapted to his bodily needs, according to the climatic conditions; hence, when a man endeavors to live on the same dietary in the tropics that he has been accustomed to in the temperate zone, digestive disturbances are sure to follow.

The writer does not claim to be an expert dietitian, but there are few spots on the habitable globe that he has not visited; scarcely an edible article that he has not partaken of; scarcely a known species of human being that he has not eaten with, except the Patagonians and the Esquimaux; so that he is not entirely without experience, and it may be just possible that practical experience thus gained may be as valuable as statistics compiled in an office from data collected from different sources.

We often have the Eastern peoples (notably the Japanese and Hindoos) quoted as examples of physical health and endurance, and the adoption of a vegetarian diet urged on those grounds; but these extremists seem to lose sight of the fact that these peoples are the descendants of vegetarians for centuries past; that they have inherited the tastes of their pro-

genitors, and have evolved their present physical condition through a long period of development along those lines. To say nothing of the impracticability of suddenly converting a nation to the principles of vegetarianism, radical changes abruptly undertaken are always productive of ill effects.

It will help us to a proper understanding of the food question to consider right here what causes old age, or, rather, the physical signs of bodily infirmity that almost invariable accompanies it. We are all familiar with the wrinkled body surface, the shrunken limbs and the stiffness of joints that particularly affect the aged, and are so accustomed to regard these outward manifestations of infirmity as inevitable, that few stop to inquire whether it is natural that this should be so. Undoubtedly, these are natural effects, being the result of the operation of natural law, but if mankind lived more in harmony with Nature, these symptoms should not manifest themselves before the age of ninety or a hundred, if even then.

What is termed old age is simply ossification

(solidification of the tissues), and this is due to the constant deposition in the system of earthy substances. The result of these deposits being retained in the system is: that there is an excess of mineral matter in the bone tissue, which renders it brittle, and accounts for the susceptibility to fracture in advanced life; it causes a change in the structure of all the blood vessels, great and small, thickening their walls and thus reducing their calibre and also rendering them brittle. With diminished capacity the blood vessels fail to convey the requisite nutrition to the tissues, and a general lowering of the vitality follows. The capillaries no longer supply the skin with its needed pabulum, hence it loses its elasticity and color —grows yellow and forms in furrows. The circulation being sluggish, the deposition of these earthy substances in the neighborhood of the various joints and the muscular structures is facilitated, and we have the stiffness of joints and muscular pains that usually accompany age. The supply of blood to the brain and nerve substance is curtailed in the same manner, and for lack of sustenance these struc-

tures commence to decay, which accounts for diminished mental activity and sensory impressions. As the process continues there may be almost complete obliteration of the capillaries, while the larger vessels may become so thickened that their capacity is sometimes reduced three-fifths. Then comes death.

Then, since old age is due to the cause just described, it follows, as a perfectly logical deduction, that if we can prevent the introduction of these substances into the system, or even check them, then the duration of life and preservation of function should be proportionately prolonged.

What are these substances and whence are they obtained. They consist of carbonate and phosphate of lime, principally, with small quantities of the sulphates of lime and magnesia, and a small percentage of other earthy matters. These substances are taken into the system in the food we eat and the water we drink, and it has been estimated that enough lime salts are taken into the system during an average lifetime to form a statue the size of the individual. Of course, the greater part is

eliminated by the natural processes, but enough is retained to make ossification a formidable fact.

So great is the proportion of mineral substance taken into the system in drinking water that it is safe to assert that, if after maturity was reached, only distilled or other absolutely pure water was partaken of, life would be prolonged fully ten years. Up to the mature age it would be inadvisable, as the salts are necessary for bone formation. Good filtered rain water, or melted snow, are entirely free from mineral deposits, but if they have stood for any length of time it is advisable to boil them before using, to destroy any organic matter.

But it is not in water alone that these pernicious earthy matters are found. All food substances contain them to a greater or lesser extent. The order in which foods stand in the matter of freedom from earthy impurities is as follows: Fruits, fish, animal flesh (including eggs), vegetables, cereals; so that the advocates of a strictly vegetable diet find themselves confronted by the formidable fact that their mainstay is that class of foods that con-

tain the largest proportion of those substances that hasten ossification. Ample proof is at hand that a strictly vegetable diet results in what is known as atheroma (chalky deposit), an affection of the arteries. Dr. Winckler, an enthusiastic food reformer, who wrote extensively on the subject under the nom de plume of Dr. Alanus, and practised a strict vegetarian diet for some years, was compelled to abandon it, on account of the above disease manifesting itself. Numerous similar cases were observed by Raymond, in a monastery of vegetarian friars, and among the poorer Hindoos, who live almost exclusively on rice, this trouble is of frequent occurrence.

The reason of this is obvious. Vegetable food is richer in mineral salts than animal food, and consequently, more are introduced into the blood. There are exceptions, for instance, fruits, which are an ideal food, for several excellent reasons. To commence with, they contain less earthy matter than any other known organic substance; they contain upward of 70 per cent. of the purest kind of distilled water—distilled in Nature's laboratory;

and distilled water is an admirable solvent, and is ready for immediate absorption into the blood, and, lastly, the starch of the fruit has, by the sun's action, been converted into glucose, and is practically ready for assimilation. In point of nutritive value, fruits may be classed in order as follows: Dates, figs, bananas, prunes, apples, grapes.

Bread has long been known as the "staff of life," and although it forms the main dietary staple for large numbers of people, that does not in any way prove its eligibility as an article of food. We have seen that cereals contain a very large proportion of inorganic matter (the mineral salts), and wheat is as richly endowed in this respect as any of its fellows. Wheat is rich in heat-producing qualities, which is due to the quantity of starch it contains. Now, this starch must be converted into glucose before the system can appropriate it, and as exhaustive experiments have shown that not more than four per cent. of the starch is converted by the ptyalin in the saliva, the principal work of dealing with the starch devolves upon the duodenum, or second stomach, the

fluids of the main stomach having no action upon it.

Now, this extra and unnecessary work falling upon the small intestine entails a delay in the process of digestion, and a corresponding delay in assimilation, so a habit of intestinal inactivity is induced, and the seeds of constipation are sown, as the starchy foods, being slow in giving up their nutritive elements, the refuse is proportionately backward in being eliminated. Fruits, on the contrary, although equally rich in heat producing qualities, yet on account of the previous natural transmutation of starch into glucose, are in a condition for immediate appropriation by the system, and consequently absorption of nutrition and elimination of waste are equally prompt. This partially explains the aperient action of fruits, although there is a chemical reason also. For the reasons above stated, lightly baked bread should never be eaten; it should be toasted thoroughly brown first, by which the first step in the conversion of the starch is accomplished.

Nuts are an excellent article of diet, as they

contain a large percentage of proteid (muscle-forming) substance, and fats—both in a state of almost absolute purity, but are somewhat deficient in starch. To those who feel that they really cannot do without meat, nuts certainly offer the best substitute. There are preparations of nuts on the market now, called nut-meats, but our advice would be, to eat all nuts without preparation, only being careful to masticate them thoroughly. The peanut is the first in rank for nutritive value, next comes the chestnut, and third, the walnut.

Our objection to nut-meats applies to all forms of concentrated foods, that is, that they do not give the digestive functions the proper amount of exercise. They do not afford sufficient opportunity for mastication, hence the food is not properly insalivated. And, again, in normal conditions, Nature demands a certain amount of bulk, that the digestive organs may have something to contract upon. It is the nature of the muscular structure to grow if exercised, and there is no reason to doubt that the stomach and intestinal muscles re-

spond to this stimulus. Bulk is especially necessary in the intestinal canal, to supply a certain amount of irritative stimulation, for the purpose of exciting peristalsis. That is one reason why whole wheat bread is preferable to white, on account of the bran, which not only supplies the bulk, but favors elimination by its irritative action.

Before proceeding any further we would call attention to the following table, showing the nutritive ingredients in food substances, and their several functions. The ingredients are classified in four divisions: 1, Proteids; 2, Fats; 3, Starches, or carbo-hydrates; 4, Mineral matters. This is the main classification; but to enable it to be better understood, we subdivide it as follows:

Protein.

a. Albuminoids: e. g. albumen (white of egg); casein (curd) of milk; myosin, the basis of muscle (lean meat) gluten of wheat, etc.

b. Gelatinoids: e. g. collagen of tendons; ossein of bones, which yield gelatin or glue. (Meats and fish contain very small quantities of so-called "extractives." They include kreatin and allied compounds, and are the chief ingredients of beef-tea and meat extract. They contain nitrogen, and hence are commonly classed with protein.)

Fats.	e. g.	fat of meat; fat (butter) of milk; olive oil; oil of corn, wheat, etc.
Carbohydrates.	e. g.	sugar, starch, cellulose (woody fibre).
Mineral Matters.	e. g.	calcium phosphate or phosphate of lime; sodium chloride (common salt).

In this classification, water is not taken into account, for the reason that it is not a true nutrient, although of vital importance to the body. Now, let us consider what ultimately becomes of these substances—how Nature utilizes them in the physical economy. Protein is used to build up the solid tissues of the body, the muscles and tendons. It is also a source of nutrition for brain and nerve substance, and partially serves as fuel. Fats simply form fatty tissue and serve as fuel to maintain the heat of the body, by combustion or oxidation. Carbo-hydrates mainly serve as fuel, owing to the large percentage of carbon they contain, which readily unites with the oxygen. The mineral matters, which are also largely obtained from water, are employed in the formation of bone, and are also utilized in the blood and in other ways.

Thus we see that each constituent of the food substance fulfills a specific purpose, and

the secret of a correct and nutritious diet lies in the selection of such foods as will furnish the proper proportion of each constituent to serve the purpose for which it is designed. Any deviation from this rule must of necessity result in digestive disturbance, more or less, and although one or two digressions from the path of correct alimentation may not result in anything worse than a slight inconvenience, yet persistence in dietetic errors will inevitably terminate in physical demoralization.

Authorities differ as to the actual proportion the nutritive ingredients should bear to each other in the daily ration; but after comparing the statements advanced by different food experts, we think the following figures will represent a fair average of the various tables. The reader will see that 100 parts of carbo-hydrates is taken as the basis of calculation, the figures opposite the other ingredients representing the proportion they should bear to the basic figure.

Carbo-hydrates (carbonaceous material, starch, sugar, etc.), fat, and heat formers.	100	parts
Proteids (nitrogeneous material), muscle, tissue and brain formers	40	"
Fats (animal fats, butter, etc.), fuel formers	32	"
Mineral salts	6	"
Water	670	"

With the above table in mind, it will be easy to select foods that will furnish, when combined, the proper proportion of each ingredient—that is—approximately, and to assist in the selection, we subjoin a condensed list of the more important articles of food, showing the percentage of each ingredient, as proved by analysis. We would call attention to the fact that animal foods may slightly differ in the ratio of the ingredients, owing to the food upon which the animal has been raised, and its physical condition; and, owing to the peculiarities of soil, vegetable foods may differ in like manner, but for practical purposes it will be found sufficiently correct.

In 100 Parts.

	Proteids.	Starches.	Fats.	Salts.
Lean Beef	20.2	0.0	3.6	2.0
Fat	16.9	0.0	20.0	3.1
Mutton	17.1	0.0	5.7	1.3
Veal	18.5	0.0	4.4	0.5
Pork	14.5	0.0	37.3	0.8

	Proteids.	Starches.	Fats.	Salts.
Poultry	21.0	0.0	3.8	1.2
Smoked Ham	24.0	0.0	36.5	10.1
Mackerel	23.5	0.0	6.7	1.0
Cod	27.0	0.0	0.3	22.0
White of Egg	20.4	0.0	0.0	1.6
Yolk of Egg	16.0	0.0	30.7	1.3
Cow's Milk	4.2	4.5	3.7	0.7
Cheese	28.0	1.0	23.0	7.0
Butter	2.0	1.0	85.0	1.0
Cabbage	5.0	7.8	0.5	1.2
Asparagus	1.9	2.7	0.2	0.5
Mushrooms	2.5	4.7	0.2	0.7
Potato	2.2	21.8	0.2	1.0
Sweet Potato	1.0	25.2	0.2	2.7
Celery	1.5	0.8	0.4	0.8
French Beans	23.7	55.6	2.2	3.7
Lima Beans	21.9	60.0	1.9	2.9
Green Peas	6.3	12.0	0.5	0.8
Lentils	24.8	54.7	1.8	2.4
Wheat Flour	11.6	71.0	1.3	1.6
Barley Flour	10.5	66.7	2.4	2.6
Oatmeal	12.8	65.6	5.6	3.6
Lentil Flour	25.4	57.3	1.8	2.6
Arrowroot	0.8	83.5	0.0	0.3
Chestnut	14.6	60.0	2.4	3.3
Sweet Almond	23.5	7.8	53.0	3.0
Peanut	28.3	1.8	46.2	3.3
Walnut	15.8	13.0	57.4	2.0
Apple	0.4	7.2	0.0	0.5
Cherry	0.7	10.2	0.0	0.7
Grape	0.6	14.2	0.0	0.5
Banana	4.9	19.2	0.6	1.1
Dates	6.6	54.0	0.2	1.6
Figs	6.1	60.5	0.9	2.3
Honey	0.8	74.6	0.9	0.2

Since the elements are seldom, if ever, found in the proper proportion in any food substances, it becomes necessary to exercise judg-

ment in selecting them, so that something like a well-balanced diet may be obtained; so as a further aid to enable the reader to make his selection judiciously, we would call attention to Table A on page 119 and Table B on page 120. Table A shows the proportion of various foods that is ordinarily digested, while Table B points out the time required for different articles of food to digest.

TABLE A.

Showing the relative digestibility of various foods.

	Protein		Fats		Carbo-hydrates		Mineral Matters	Water
	Digestible	Undigestible	Digestible	Undigestible	Digestible	Undigestible		
	%	%	%	%	%	%	%	%
Beef, round	23.0	0.0	8.1	0.9	0.0	0.0	1.3	66.7
Beef, sirloin	20.0	0.0	17.1	1.9	0.0	0.0	1.0	60.0
Pork, very fat	3.0	0.0	74.5	6.0	....	....	6.5	10.0
Haddock	17.1	0.0	0.3	....	0.0	0.0	1.2	81.4
Mackerel	18.8	0.0	7.4	0.8	0.0	0.0	1.4	71.6
Hen's eggs	13.4	0.0	9.4	2.4	0.7	0.0	1.0	73.1
Cow's milk	3.4	0.0	3.6	0.1	4.8	0.0	0.7	87.4
Cheese, whole milk	27.1	0.0	34.6	0.8	2.3	0.0	2.9	33.2
Butter	1.0	....	85.8	1.7	0.5	....	2.0	9.0
Oleomargarine	0.4	....	83.9	3.3	0.0	....	2.1	10.3
Sugar	0.3	....	....	....	96.7	0.0	0.8	2.2
Wheat flour: very fine	7.6	1.3	1.0	....	71.4	0.8	0.3	14.6
Wheat flour: medium	9.5	2.1	0.8	....	70.4	1.8	0.4	15.0
Wheat flour: coarse whole wheat	8.2	2.7	1.8	....	66.4	5.3	1.2	14.4
Wheat bread average	7.7	1.2	1.9	....	54.9	0.6	1.0	33.7
Black bread	4.5	1.6	1.8	....	43.2	5.2	1.5	42.8
Peas	19.7	3.2	....	....	55.7	2.1	2.5	15.0
Corn (maize) meal	7.9	1.2	3.8	....	68.7	2.3	1.0	14.5
Rice	6.2	1.2	0.4	....	78.7	0.7	0.4	12.4
Potatoes	1.5	0.5	0.2	....	19.7	1.6	1.0	75.5
Turnips	0.7	0.3	0.2	....	5.6	1.3	0.7	91.2

TABLE B.

LENGTH OF TIME REQUIRED FOR DIGESTION OF DIFFERENT ARTICLES OF FOOD.

	Hours
Apples, raw	2:00
Barley, boiled	2:00
Beef, roasted	3:00
Beefsteak, broiled	3:00
Beef, boiled	4:00
Beets, boiled	3:45
Brains, animal, boiled	1:45
Bread, corn, baked	3:15
Bread, wheat, baked	3:30
Butter, melted	3:30
Cabbage, raw	2:30
Cabbage, with vinegar	2:00
Cabbage, boiled	4:30
Cake, corn, baked	3:00
Cake, sponge baked	2:30
Catfish, fried	3:30
Cheese, old, strong	3:30
Chicken, fricasseed	2:45
Corn and beans, boiled	3:45
Custard, baked	2:45
Duck, roasted	4:00
Dumpling, apple, boiled	3:00
Eggs, hard boiled	3:30
Eggs, soft boiled	3:00
Eggs, fried	3:30
Eggs, roasted	2:15
Eggs, raw	2:00
Fowls, boiled	4:00
Fowls, roasted	4:00
Goose, roasted	2:30
Lamb, boiled	2:30
Milk, boiled	2:00
Milk, raw	2:15
Mutton, roasted	3:15
Mutton, broiled	3:00
Mutton, boiled	3:00
Oysters, raw	2:55

	Hours.
Oysters, roasted	3:15
Oysters, stewed	3:00
Pig, roasted	2:30
Pigs' feet, pickled	1:00
Pork, roasted	5:15
Pork, salted and fried	4:15
Potatoes, Irish, boiled	3:30
Potatoes, Irish, roasted	2:30
Rice, boiled	1:00
Salmon, salted	4:00
Soup, barley, boiled	1:30
Soup, bean	3:30
Soup, chicken	3:00
Soup, mutton	3:30
Soup, oyster	3:30
Tapioca, boiled	2:00
Tripe, pickled	1:00
Trout, salmon, boiled	1:30
Trout, salmon, fried	1:30
Turkey, roast	2:30
Turkey, boiled	2:30
Turnips, boiled	3:30
Veal, broiled	4:00
Veal, fried	4:30
Vegetables and meat hashed	2:30
Venison steak	1:35

We have seen that certain elements are necessary in our food for the proper replenishment of the waste that is perpetually going on, and that they must be combined in proper proportions, so that no one part of the body shall be over-nourished at the expense of the others —no organ overtaxed, but that all may be harmoniously developed.

Opinions may, and do, vary as to the source

from which this sustenance for the body should be obtained—whether from the animal or vegetable kingdoms, or both, and while admitting that vegetarianism and flesh-eating both have their advantages and disadvantages, our own conscientious conviction is, that the true solution of the question is to be found in the happy medium—that a mixed diet is the best for mankind under existing conditions.

The main argument of our vegetarian friends against the practice of flesh-eating is the humanitarian one. We are familiar with all the objections urged—the brutalizing effect upon the human mind of so much ruthless blood-shed—of the sacredness of life, and of man's presumption in daring to deprive a living creature of existence; but with all due respect to the sensibilities of these worthy people, we are inclined to think that the argument is scarcely tenable. We do not wish to be understood defending the cruelties that are said to be practised in the abattoirs; but the taking of life is inseparable from existence. It is simply a question of degree. There is a sect in India, the members of which are so scrupu-

lous regarding the sanctity of life that they carefully brush every step of the path in front of them, lest they should inadvertently step upon any creeping thing. In this, they lift the burden of responsibility from themselves for any wanton injury; but the microscope has shown us that there is a countless world of infinitesimal life all around us, and that it is practically impossible to draw a breath, or drink a mouthful of water, without destroying some living thing. If we accept the teaching of the Scriptures, that not a sparrow falls to the ground without the knowledge of the Creator, then we must conclude that the life of the ant is of as much importance in His eyes as that of the ox or sheep. We repeat, we are not posing as advocates of indiscriminate and wanton slaughter, but on utilitarian grounds, we consider the use of the flesh of animals, as a food, justifiable.

If we needed any scriptural authority for the practice, we could point to the Hebrews, who (according to Holy Writ) received through Moses not only permission to use meat as an article of diet, but instructions for the

killing of the selected animals, together with injuctions to avoid the flesh of certain kinds; and they may be cited as a striking example of the value of a mixed diet.

Here we have one of the most ancient races of the earth—a race that has endured the most terrible persecutions that ever befell a people, yet have survived it all, and are to-day a robust and unusually prolific race; while intellectually and morally they are surpassed by none. They are a greater power in the world than any other race, by reason of their skill in finance and natural business instincts. There is no question but that the sanitary system of living established by Moses, has been the principle factor in perpetuating this hardy race; and a mixed diet was and is an integral part of that system.

However, we have no desire to impose our views upon our readers, and having given expression to our sentiments, we return to the main question.

Having disposed of the question, "what to eat," we will consider another matter, almost equally important, and that is:

How to Eat.

The one fundamental principle underlying this question is thorough mastication, and we cannot too strongly impress upon our readers the necessity for its proper observance. We have already stated that digestion commences in the mouth—that by the action of the saliva, the starchy matter in food is converted into glucose. It is therefore necessary that the saliva should be brought into intimate contact with every part of the bolus; and for that purpose thorough mastication is absolutely necessary. In addition, the separation of the food into small fragments, by the teeth, assists stomach digestion, by permitting the gastric juice freer access to the food.

Drinking at meals should be avoided as much as possible. The philosophy of this is apparent, when we reflect that most digestive disturbances are accompanied by imperfect secretion of the gastric juices, and to dilute them with an excess of fluid is to weaken its power of action on the food.

But the most pernicious practice of all is

that of drinking iced water at meals, since, in addition to the ill effects described above, it temporarily paralyzes the stomach—driving the blood away from that organ when it is needed most of all. A fact which should not be lost sight of is, that no physical operation, however slight, can be accomplished without the expenditure of force (nervous energy), even though it be only the winking of an eyelid; and the labor entailed upon the system, of raising the temperature of the stomach to normal figures, after deluging it with ice water, involves a ruinous waste of vital force, in addition to the other reasons urged against it. It cannot be doubted that this essentially American habit is responsible for a large proportion of the dyspepsia that sits like an incubus upon the nation.

All condiments promote indigestion. They overstimulate the stomach, exciting the secreting glands to abnormal action, and irritating the sensitive mucous surface.

When to Eat.

For people in health, we strongly advise the three meals a day system, which experience has shown to be successful. They should be moderate in quantity, and should be eaten as follows: The first, from half an hour to an hour after rising (having previously bathed and exercised), the second, not less than four hours afterwards; the third, not less than five hours later.

This gives the stomach time to rid itself of one meal before the next is introduced, otherwise the undigested food remaining in the stomach prevents that organ from acting properly on the fresh food. It is for this reason that it is unwise to eat between meals, as, when the stomach is occupied by articles of food in various stages of digestion, undigested portions will pass out with the digested food; not only entailing a serious loss of energy and nutrition, but irritating the intestinal canal and creating unnecessary waste to be eliminated.

The above rules, as stated, apply to people in ordinarily good health. In wasting disease

it may be necessary to supply nutrition even as often as every half hour; and in all serious digestive troubles it is wiser to eat six times a day than three, the meals to be light, nutritious in quality, and small in quantity, so as not to impose too great a burden at one time on the weakened digestive apparatus.

We will now consider the action of several substances, in common use, that are inimical to health, and that have an especially demoralizing effect upon digestion.

The first of these is alcohol, which only serves as fuel, but does not form tissue. Its best friends in the medical profession no longer claim anything for it but a stimulating effect. Its action on the digestive organs (especially the stomach) is disastrous in the extreme. It destroys the appetite, although it temporarily sustains vigor by unnatural excitation.

The man who is addicted to the excessive use of alcoholic stimulants is over-taxing the vital organs of his body in the most outrageous manner, and although Nature incessantly enters protest against being overworked, he either ignorantly fails to recognize its warn-

ings, or wantonly disregards them. Let us for a few moments consider the work which the heart is called upon to do, and the amount of extra labor imposed upon it by the unwise use of alcohol. The average life of a man is thirty-eight years, and, in a healthy man, the number of heart-beats per minute is seventy, or during an average life, 76,536,740,000. Now, the use of alcohol in anything like an excessive quantity increases the action of the heart ten beats per minute, making 600 extra beats per hour, 14,400 per day, 482,000 per month, 9,784,000 per year, 195,568,000 in twenty years, and 372,793,000 in a lifetime of thirty-eight years. Or, supposing a man should live fifty years, the number of pulsations of the heart during that period, at the normal rate, would be 917,239,680. Now, if ten extra beats be added to this, for say the last twenty-five years, we find that the heart is called upon to make 91,840,000 extra beats. Think of that enormous amount of additional work imposed upon a delicate, complex piece of mechanism like the human heart!

But that is not the worst of it. The heart

should rest and sleep when we do. During sleep, the character of the beats is different from what it is during our waking hours—the beats are made singly and deliberately, with a pause between, for the heart is taking its necessary rest, to fit it for its functions on the morrow; but, if we take alcohol into the system before retiring, then the heart works harder during sleep than a healthy man's when he is awake.

Tea and coffee are substances which neither form tissue nor serve as fuel, and may be banished from the table with decided advantage. It is true that the consequences of excessive tea drinking are not as severe as those from over-indulgence in ardent spirits, but the pernicious effects of the constant drinking of strong infusions of tea justify us in calling the practice a serious menace to health. Tea leaves contain from 2 to 4 per cent. of caffeine, or theine, which is an alkaloid, and always found in combination with tannin. They also contain a volatile oil, which is the source of the aroma, and in addition possess a sedative quality. Tannin is a powerful astringent, and

hence is strongly provocative of constipation. Its action upon the mucous surface of the stomach is highly detrimental to that organ, as it arrests the excretion of the gastric juice by its contractile effect upon the glands. Its constant use will almost invariably result in digestive disturbances, and will certainly aggravate such troubles, if previously existing. It is true that a cup of hot tea is a refreshing beverage, but not more so than a cup of hot milk—in fact, it is the heat that imparts the sense of comfort experienced on drinking it. Children should never be allowed to drink either tea or coffee, as the seeds of a baneful habit may be sown, for in tea, as in dram drinking, is a habit easily acquired.

The above remarks apply in a less degree to the frequent use of coffee. The constant use of these substances produce the following results—first, increase of circulation, rise in pulse, a desire to frequently pass urine, and an exhilaration resembling intoxication. Tea tasters, as is well known, are subject to headaches and giddiness, and prone to attacks of paralysis.

General Suggestions.

One of the causes that conduce to digestive disturbances is that of solitary eating. It is a pretty well-known fact that a woman would just as soon not eat at all as to eat alone, and as a result frequently deprives herself of the necessary amount of nutrition. In fact, she impairs her digestion by not giving it sufficient work to do, while the man ruins his by spasmodically overtaxing it. For the above reasons, companionship at meals is a most desirable thing, especially if it is congenial, and light, cheerful conversations, with a little hilarity intermingled, is an excellent aid to digestion.

This is, no doubt, due to mental influence. The whole of the alimentary process is under the control of the nervous system, which has its seat in the brain, consequently, a cheerful mental attitude favors digestion. It is well known that a fit of anger may temporarily stop digestion. The mind exerts such a vast influence over every function that it is impossible to set bounds to it. We are the creatures

of habit. We eat so many times a day, from sheer force of habit. We habituate ourselves to partake of articles of food against which, at first, the senses rebel, by the same force; but it is left wholly to man's reasoning powers whether his habits shall be cultivated according to the needs of the system. If they are, perfect nutrition will be established; if they are not, he is worse off than the animal who knows only to follow the instincts of the original habits of the species. A man can exercise his will power to partake of a diet which his taste had not been able to appreciate, yet no will power can ever provide good nutrition out of a diet against which taste constantly rebels. Consciousness of the digestive organs is an offense to them. The more a man is conscious of his stomach, the less will be its capacity for performing good service; therefore, a dyspeptic should never attempt to follow a course of experimental dietetics with himself, for if he watches his stomach after his carefully selected meal, to see how it will serve him, he will always find abnormal symptoms.

Active respiration assists all forms of lymph

absorption, but gives special aid to the absorption of food substances from the stomach and intestines, because these particular lymph vessels are situated so close to the chest cavity that they are more directly under the influence of the suction action of the chest.

A few minutes spent in vigorous deep breathing exercises after each meal is one of the best means of remedying the sense of heaviness and weight of which so many complain after eating.

Thus we see that deep breathing, by favoring absorption, promotes the nourishment of the body—will assist in building tissue, in fact. Oxygen is a vital necessity for the body, and it is necessary to absorb a large quantity for the actual needs of the system, while all absorbed over the quantity means added nutrition.

The human body is a wonderfully complex piece of mechanism, and if left to itself or rather to natural guidance, its manifold functions are performed with unfailing regularity; and regularity in function means health—irregularity, disease.

Mark the rhythmic regularity of respiration.

or of the heart's contractions! Long continued regularity begets habit, which is a form of automatism; hence the necessity of regularity in action along fixed lines, and in consonance with physiological law, that good habits only may be formed.

Good habits are absolutely essential to health, which is equivalent to saying that regularity in living is an imperative necessity to that end. Regularity in rising and retiring; regularity in eating and drinking; regularity in exercise, all are equally important.

Not only does this regularity of conduct conduce to the attainment and maintenance of perfect health, but it enables the individual to accomplish more within the limits of the day, partly by economizing time, and partly by the added vigor due to improved health.

First, regularity in the hours of rising and retiring, namely, regulating the minimum period to be devoted to sleep. There is much conflict of opinion as to the amount of sleep necessary for the average adult. We have in mind an old saying which runs as follows: "Six hours' sleep for a man, seven for a woman, and

eight for a fool." This is somewhat arbitrary, and, moreover, is not in harmony with physiological law. In the first place, no hard and fast rule can be laid down that will cover all cases. Apart from the difference of sex, there are temperamental conditions which vary with every case. We are decidedly of the opinion that eight hours' sleep is necessary for the adult individual. It has been affirmed by some authorities that the more the individual sleeps the longer he will live, which is a perfectly rational claim, in view of the fact that night is Nature's repair time, when she is busy at work replacing the ravages committed by wear and tear during the day. It is a well-known fact that nearly all growth takes place during sleep.

Again, it is a fact not generally known that the heart receives no nourishment during the period of contraction, owing to the pressure upon the arteries which supply it with nutriment. It is only during the infinitesimal pause between the contractions that these arteries can carry blood to the heart tissue; hence during sleep the heart-beats differ from those of our waking hours, being fewer in number, and

with a more decided pause between. Now, the heart being to the body what the mainspring is to a watch, the necessity of affording it ample time for recuperation becomes apparent.

Next comes the question of exercise. Too little attention is paid to this matter, more especially by those engaged in sedentary occupations; yet it is in the highest degree important that the balance between the mental and physical energies should be maintained. To preserve this balance while the mind is active and the body untaxed, artificial exercise must be practiced, for physical strength cannot be promoted without some kind of bodily exercise. Unused muscles soon become flabby, as athletes and their trainers well know. The best time for taking exercise is, as stated above, just after the morning bath, and it is astonishing what results can be obtained from fifteen minutes of intelligently directed exercise each morning. Here, again, regularity will work wonders. It may be a week or two before you will notice any marked improvement in the muscular condition, but you will be amply repaid by the glow of health which pervades the

system as the results of stimulated circulation.

Last, but by no means least, comes the matter of solicitation of the bowels. In this case regularity in solicitation will invariably produce regularity in movement. The bowels should be solicited every morning, soon after rising, and every night just before retiring. We only wish that we could impress every one of our readers with the importance of this practice, and of the immense benefit of regularity in the pursuance of it. Just as the stomach requires the habit of expecting food when regularly supplied to it at stated intervals, even so will the bowels respond to solicitation if regularity be persisted in.

Nature is inexorably opposed to caprice. She executes all her processes in an orderly manner, and if not interfered with, with the greatest regularity, and if man will only cooperate with her by strict regularity in the important duties previously mentioned, the result will be a surprise to him in the form of renewed health and vigor. He will have an unclouded mind, and be ready to face the trials

of everyday existence with a courage that nothing can daunt.

But Nature demands an accurate accounting. Man thinks but little of the drafts he is continually making upon his vitality, but sooner or later the account will be presented, and payment exacted in full. There is no such thing as vicarious payment. The debtor must pay in person, and it therefore behooves every man to watch the debit side of his life's ledger, and make a daily balance of his account with Nature.

PART VII.

Treatment of Constipation.

This condition of the system has been so frequently referred to already that further comment upon it may be deemed unnecessary. Its causes are varied, insufficient exercise in the open air, hastily eaten and imperfectly masticated food. Also many articles of food tend to induce the evil of habitual constipation.

Whatever you may do, avoid everything in the form of drugs, for they are injurious in the highest degree. The continual excitation of the excretory processes by the use of cathartics is a most pernicious practice and should be shunned.

The "Cascade" should be used each alternate day, for at least two weeks, then, twice a week, until improvement is assured. Drink a tumblerful of hot water, not less than half an hour

before breakfast, and eat freely of fruit at that meal. Also partake liberally of good, green vegetables at other meals. Eating whole-wheat bread is of decided assistance, and make it a rule to drink from two to three quarts of water each day.

The following general classification will enable anyone to select a suitable dietary to overcome even the worst case of Constipation.

The regular use of the Cleansing Tonic is very important in the treatment of chronic constipation—as it tends to tone up the bowel muscles and strengthen the intestines, thereby overcoming costiveness.

General Rules.

Diets should consist largely of easily digested fats and oils, green and fresh cooked vegetables, such as leave a large residue in the bowels. Moderate exercise and regularity in habits are important adjuncts to treatment. Active cathartic drugs should be avoided.

ARTICLES PERMITTED

SOUPS. Meat broths, oyster soup, vegetable soup.
FISH. Boiled fish of all kinds, raw oysters.
MEATS. Any tender fresh meats, poultry, game, moderate quantities only, with some fat.

EGGS. In moderation, soft cooked (with salt and butter).

FARINACEOUS. Brown or Graham bread, oatmeal, mush, hominy, whole wheat bread, Boston brown bread, the various breakfast foods, gluten bread, bran flour bread, bran biscuits, bran as a cereal.

VEGETABLES. Boiled onions, Brussels sprouts, spinach, cauliflower, potatoes, asparagus, green corn, green peas, string beans, salads with oil, celery, Spanish onions (boiled), cabbage, tomatoes, rhubard, beets, carrots, cucumbers, lettuce, olives, olive oil, parsnips, radishes, turnips.

DESSERTS. Fruit in considerable quantities (especially fresh) stewed prunes, figs, baked apples, ripe peaches, pears, oranges (on arising), apples, melons, grapes, cherries, raisins, honey, dates, strawberries, apricots, cantaloupe, pineapple, cranberries, currants, fruit ices, fruit juices, fruit jellies, grape fruit, plums, plain puddings, English walnuts, almonds, molasses.

BEVERAGES. Plenty of pure water, hot on arising, cold (not iced) water between meals and at bedtime. Cocoa, new cider, buttermilk, lemonade, unfermented grape juice, cream.

ARTICLES TO BE AVOIDED

Salted, smoked, potted or preserved fish or meats, beets, puddings made of rice, sago, pastry, milk, tea, cheese, bananas, hot or fresh bread, pickles, hard boiled eggs, fried foods, pork, veal, liver, red or sour wines.

MASSAGE, SHEET-PACKS, ETC.

Massage.

This is the application of motion and pressure to the body, and is a most important factor in preserving or restoring health. It affords a sick person many of the benefits to be obtained from exercise without the physical effort, which he is unable to exert. The sweat glands, capillaries, and lymph channels, which constitute many miles of tubing, and in the body of a grown person, are, by carefully and systematically applied massage, stimulated to action. The currents in these vessels are a necessity of life. When they are obstructed, weakness is the result; when they cease, decay and death ensue.

When we rub our hands or feet, we say the friction warms them; in reality it is the inner vessels which are stimulated, and bring more

warm blood to the parts. If this process is extended over the whole available surface of the body, the most beneficial results will follow.

There are three recognized methods of application.

First—Rubbing, to stimulate the skin to action.

Second—Rolling, and pinching gently, also a kneading movement, used principally to stimulate the stomach, bowels, and muscular tissues.

Third—Percussion, or tapping with the ends of the fingers, softly—most efficacious in stimulating the action of the lungs.

Rub the surface first with a little olive oil, or vaseline. Use the tapping movement for the chest and back, the rubbing movement for the stomach and bowels, and the pinching or kneading movement for the limbs. In dyspepsia and constipation, great benefit is derived from massage treatment of the stomach and colon—starting the movements in the right groin, where the colon commences, and following its course to its rectal extremity (con-

sult diagram). For rheumatism, sprains, etc., commence with hot oily applications.

Most people find massage treatment to have a gentle, soothing effect. Nearly all find their appetite increased.

The Stomach Bath.

The first method is simplicity itself, and consists in drinking from half to a pint of hot water, as hot as can be drunk with comfort, in the morning after rising, or half an hour before breakfast. It loosens up the mucus in the stomach, and in half an hour it will have passed out.

The Turkish Bath.

Provide a wooden bottomed chair, and having stripped the patient of all clothing, except a pair of woolen drawers to protect his legs from the heat, let him sit on it, with his feet ankle deep in a hot foot bath, just as hot as he can bear. Wrap him about first with a blanket, tucking it close around the neck, but letting it hang loose over the chair and vessel containing the foot bath, but so arranged as to exclude the air from his person. Over the

blanket wrap one or two heavy comfortables, the object being to prevent the escape of the heat and exclude the outside air from the body. Raising one side of the comfortables and blanket, place under the chair an old tea-cup half full of alcohol. Set it on fire and again close the opening. Give him a drink of cold water, and if the head feels oppressed, apply a wet towel wrung from cold water. Add more hot water to the foot bath once or twice, keeping it as hot as he can bear it during the continuance of the bath. Keep him in the bath until the alcohol is all burned out. Then wash him down with soap and tepid water, sponge off with cool water, rubbing the flesh and working the muscles vigorously the meanwhile. Then dry off by patting the skin with the towel (not rubbing it), leaving a little moisture on it; dress quickly and let him lie down for an hour or put him to bed.

The Wet-Sheet Pack.

Spread over the bed or cot two or more heavy comfortables, over these a pair of blankets, then, if for a person of strong vitality,

wring a sheet out of cold water just dry enough not to drip, and spread it over the blanket; lay the patient stripped of all clothing on the sheet with his arms by his sides, tuck the sheet around him, then the blankets and comfortables, leaving his head out but tucking it close around the neck and over his feet—making a mummy of him, so to say. If the head is hot or aches, apply a towel wrung from cold water and renew it as often as it gets warm. To the feet apply a hot water bottle. Let him lie in the pack from twenty to forty minutes, or even longer if he is comfortable. He will soon get warm and sweat freely. This is the end desired. If he goes to sleep, as is often the case, don't be in a hurry to wake him up. He will take no harm so long as he keeps warm. See that there is plenty of fresh air in the room. When he has been in the pack a sufficient length of time close the windows, then take him out and wash him down thoroughly with soap and soft, tepid water, then sponge off with cooler water, rubbing him down vigorously and working the flesh the meanwhile. If not too weak he should assist

in this operation. Then dry off by patting the skin with the towel (not rubbing it), leaving a little moisture on the skin. Then, if in the day time, and the weather is not too cold, a little exercise in the open air will be beneficial. If he is too weak to exercise put him to bed again.

Before and during the pack let him have all the cold water he wants to drink, in small quantities at a time. If the patient has but little vitality, wring the sheet out of tepid water instead of cold water.

The hot sheet-pack is used in the same manner, the only difference being that the sheet is wrung out of water as hot as can be borne.

Care of the "Cascade".

What is worth having is worth taking care of; and the "Cascade" is so likely to be called into emergency service, that it should be always in order—hence the following suggestions:

After using it, hang it up by the eyelet, until it ceases to drip; then put in the stopper.

The small amount of moisture left in will help to keep it flexible. It should be kept hanging, if possible, as folds in the rubber predispose it to crack. It should be kept in an even temperature, neither too hot nor too cold.

Never pour boiling, or very hot water into it—it is not designed to withstand such a degree of heat, and do not let grease, in any form, come in contact with it, as grease decomposes rubber.

PART VIII

Some Helpful Suggestions.

Prevention is better than cure, and the great elements of prevention are, knowledge of self, cleanliness, physical, mental and moral hygiene and sanitation. Nothing is so essential as a knowledge of the functioning of the body, for it is the vehicle through which the real self is to find expression; through which he is to achieve success or failure, according to the condition of its mechanism.

No engineer can obtain from the machine under his control the highest results, unless every part of the mechanism is in perfect working order. How much more important, then, that the human organism should be in perfect adjustment, since through it the mentality is to find its highest expression? Without a knowledge of its construction and its working principles, how is the individual to

raise the human machine to the highest plane of excellence and maintain it there? No one is allowed to run an engine without first passing an examination, which necessitates a certain amount of study and knowledge of the laws of mechanics; yet men undertake to run that complex machine, the human body, in utter ignorance of physiological law! Is it any wonder that there are so many breakdowns?

We may remark here that all human beings are not endowed alike with nervous force; it is largely a matter of heredity, but what we have may be cultivated and developed. Failure to do so renders the individual liable to nervous breakdown, or neurasthenia, as it is popularly termed, a widespread condition, especially in America, where the strain of life is greater than elsewhere. Competition, a desire to go beyond one's fellows in achievement, working beyond the strength, together with lack of care of the physical system, all conspire to keep constant the undue excitement of the nerves that ends in exhaustion. Children born of nervous parents, with weak nerv-

ous systems, should be fortified against the risks of inheritance by hygienic measures, during their developmental period, strengthening in every way their physical and mental endowments. Even those well developed in this respect should husband his or her resources—always keeping a reserve fund by avoiding undue fatigue, spending plenty of time in sleep, taking care of the body, and arranging for intervals of rest that shall include change of scene and environment.

Above all, cultivate the habit of happiness. Whatever else you may neglect, do not neglect that, for the happy habit is the greatest treasure that any individual can possess. Happiness depends largely upon physical conditions. With poor health, perfect happiness rarely exists; therefore it is your duty to be healthy, and the possession of health is in the majority of cases a matter of personal endeavor. But although the physical state is important in health, yet the physical is dominated by the mental, and if you resolve to be happy, you can succeed.

No surer road to personal happiness can be

found than endeavoring to make others happy. If you find it difficult to be cheerful, there is more need to look to your surroundings. Read none but cheerful books; cultivate cheerful acquaintances. You will be amply repaid for your endeavors to cultivate the habit of happiness. From the standpoint of health, it is a profitable proceeding, for joy quickens the circulation. You can get the happiness habit if you wish to, and it is your duty to yourself and those around you to do so. If the clouds are lowering, do not give way to depression. Rouse yourself. Look for the rift in the clouds, disclosing the little patch of blue, and hope for the triumph of fair weather over foul. Even if you do not attain the degree of happiness you anticipated, you will find yourself improved, mentally, morally and physically. Get the habit, remembering that "a happy and contented mind is a continual feast."

And now, in conclusion, we would ask the reader to carefully consider the facts herein set forth. It will amply repay you to do so, for the matter at stake is a weighty one. The preservation of health is a DUTY that each

member of the human family owes to self and friends.

Our purpose in this work has been to show people that they can, if they will, be their own physicians—that the preservation of their health is in their own hands. Thoroughly cleansing the system by flushing the colon is a simple, common sense method of treating constipation, easy of application, thoroughly hygienic in theory, and, beyond all question, immensely beneficial in practice. Thousands of grateful people can testify to its efficiency.

The "J. B. L. Cascade" is the most satisfactory and effective appliance for flushing the intestinal canal that has yet been invented. It is the outcome of years of patient toil and thought, but the thoroughly satisfactory results obtained from it, and the enthusiastic encomiums lavished upon it by its beneficiaries are regarded by the inventor as an ample and commensurate reward (not wholly undeserved) for the mental labor involved in its successful evolution.

Its simplicity is such that it can be manipulated by any intelligent child, and its price, by

comparison with its virtues, is insignificant. With this perfected apparatus, and the J. B. L. Cleansing Tonic, any parent can constitute himself the benefactor of his family, and by following the directions for treating constipation described in this work, can successfully combat it—and all at a trifling cost. But more than that, he can, by periodical use of the "Cascade," so improve the physical condition of himself and family, that they will forget what sickness is, and rejoice in that exhilaration of spirit that only comes with perfect health.

Our system of treatment is *true* in philosophy, in *harmony* with Nature, and thoroughly rational in practice.

PART IX

APPENDIX

WHAT TO DO IN ACCIDENTS

By Major Chas. G. Percival, M.D.

In accident prompt "first aid" for a slight injury may often prevent a serious one, or save life.

First aid is not intended to take the place of a physician's services. Whenever there is a serious injury, a doctor should always be summoned. There are times when a few minutes' delay may mean the loss of a life.

To give first aid, first examine to decide what must be done, and to see if the injuries are serious. If conscious, this is easily ascertained. If unconscious, the nature of the accident will decide the seriousness. If in no danger, a more careful examination should be made as to location and nature of the injury. Make sure that no bones have been broken before moving. Often a glance will show. Undo the clothing to determine the amount and source of bleeding.

If unconscious, note the color of face, and condition of skin, manner of breathing, nature of pulse and pupils. If bleeding is rapid stop it before making further examination. If not sufficient to place in immediate danger, proceed along these lines:

Make comfortable until a doctor arrives. Give messenger a complete description of the nature and extent of the injury. If in a dangerous place or exposed to severe weather, move, taking all possible precautions to avoid increasing the injury, especially if there are broken bones.

Loosen tight collars or belts. Keep lying down or resting comfortably in a sitting position. Lower the head and let lie horizontally for pale face. If the face is flushed, raise head on a folded coat. If vomiting occurs, turn the head to one side. Do not try to force unconscious persons to drink water or stimulants they cannot swallow.

In removing clothing, take off from the sound side first, and avoid the danger of disturbing a fracture. Cut clothing up the seams when necessary to examine an injured or

crushed limb. Check all hemorrhages before attending to anything else. Keep warm—(of great importance) and allow sufficient air. Keep the crowd back.

FIRST AID KIT FOR THE HOME

The following supplies should be included in the camp, home and first aid kit:
Aromatic spirits of ammonia, 2 oz. with a rubber cork.
Antiseptic gauze, 4 small packages; absorbent cotton, ½ lb.
Roller bandages, 8 (4 large and 4 small).
Iodine swabs (12) and Carbolized vaseline, 1 jar.
Pins, ordinary and safety; scissors, blunt and curved.
Olive oil, 4 oz., lime water, 8 oz. and Mustard, 4 oz.
Glass and spoon and Camel's hair brushes, (2).

Shock may be due to severe bleeding, abdominal injuries, fractures, burns and scalds, excessive cold, gun shot wounds, severe cuts and bruises.

Those suffering from severe shock lie in a drowsy condition but not totally unconscious. Limbs are limp and skin pale and cold; temperature below normal and barely noticeable; breathing shallow; often severe thirst, especially if caused by bleeding; usually accompanied by vomiting and hiccoughs. Shock is usually recoverable but in severe cases, death may result, as in extensive superficial burns of children or the aged. Shock may not be severe enough as to include all the symptoms mentioned. Unless slight, send for a doctor. Heat, position and stimulants are the first aid remedies.

Heat is the most valuable. Electric pads, hot water bags, and glass bottles are good. Hot bricks and flat irons are also useful but use so as to prevent burns. Test and cover with protective layers of cloth or paper. In applying, place between legs, at outer sides and between body and arms. A hot water bag over the heart acts as a special stimulant. Loss of body heat always increases shock. Never remove more clothing than is necessary. Rub the limbs toward the body. Place on back with head low so that the blood will run toward brain. Raise the feet. Never raise head. The best first aid stimulant is aromatic spirits of ammonia, a half teaspoonful in one-half glass of water, preferably hot. Other good stimulants are hot black coffee, hot tea, or hot water. Repeat in half an hour. Whiskey and brandy are injurious. Never give an unconscious person stimulant by the mouth.

Aromatic spirits of ammonia, ordinary aqua-ammonia or smelling salts may be used. Strong ammonia should be diluted with water. An inhaled stimulant is particularly useful for the unconscious, because they are unable to swallow.

A severely shocked person should not be moved until recovered to some extent. First aid should be given before moving. Clothing should be loosened at neck, chest or abdomen during transportation. Do not remove clothing, as it increases shock. All serious cases should be carried on stretchers, which can be made with two or three coats and a pair of poles. Turn coat sleeves inside out and place on the ground with the lower edges touching. Pass the poles through the sleeves on each side and button, with the buttoned side turned down.

In carrying the patient up hill, follow these rules: *Feet first:* After severe bleeding, fracture of lower limbs, fainting, shock, or if face is very pale. *Head first:* In cases of apoplexy, sunstroke, fracture of the skull, or if face is flushed. Keep stretcher as level as possible.

If able to sit up and steady himself by placing his arms around the bearers' necks, carry in the "lady's chair". Each bearer should grasp his left wrist in his right and the other bearer's right wrist in his left hand, knuckles uppermost. Then stoop and place the chair under person who steadies himself by placing his arms around their necks.

TO PREVENT INFECTION OF WOUNDS

Severe wounds may cause considerable damage to the muscles, bones, blood vessels, or internal organs, with possibility of severe inflammation. Danger of infection exists, therefore all wounds must be handled carefully. Even a pin scratch has been known to result in death.

Heat kills bacteria. All dressings, instruments used in dressings, should be first heated, by boiling. If wound is deep, or of a considerable surface, send for a doctor. Look out for shock and treat. Do not touch the wound. Exposure to the air is much safer than application of anything which is not *surgically clean.* Apply a sterile dressing at once, and bandage firmly in place.

Water, unless boiled is apt to contain germs. Too strong a solution of mercury or carbolic acid will destroy the body cells which dispose of the pus germs before they kill the latter and should never be used. Hydrogen peroxide is not

strong enough. Iodine is of value, if applied in a 3% solution immediately and not later than two hours after injury is received.

Never pour it into a wound. Use a camel's hair brush or a tuft of cotton on a stick. Never suck a wound, as dangerous pus germs are always in the mouth. Squeeze well at the sides. Adhesive plaster is unsafe. With much bleeding put on a layer of absorbent cotton over the compress (pad) before bandaging. A first aid packet should always be used in preference to anything else. The next best is antiseptic gauze. If at all serious call a doctor. Always examine the article which inflicted the injury to determine if the end may have broken off in the wound.

While waiting for the doctor, twist a small amount of cotton around the end of a toothpick, dip in iodine and push down to the bottom of the wound and work the iodine thoroughly into it. Paint surface and apply a sterile dressing.

In bleeding or hemorrhage the blood is carried through the body by three blood vessels, which are divided into (1) arteries, (2) capillaries, (3) veins.

The most dangerous form of bleeding is when an artery is cut and red blood spurts. Unless checked promptly patient will bleed to death. This can be stopped temporarily by pressure on the artery between the cut and the heart, until a tourniquet can be improvised. In all cases of severe bleeding, secure a doctor at once, but do not delay treatment.

In a cut artery, remember the flow of blood is away from the heart and that it is necessary to apply pressure between the cut and the heart. PRESS ON THE ARTERY ON THE NEAR OR HEART SIDE AS CLOSE TO THE BLEEDING POINT AS POSSIBLE. In pressing it is necessary to select a point where a bone will give a hard surface to press against.

When a vein is cut there is a continuous flow instead of in spurts. Venous blod is a dark bluish red color easily distinguishable from the bright red arterial blood.

In *wounds with severe bleeding,* first check the bleeding. Lay patient down, raise wounded part and keep the head low so that brain will get as much blood as possible. Prevent violent movements. When bleeding has ceased, the injured person should remain quiet. Give plenty of fresh air, cover warmly and put hot water bottles around. Stimulants are undesirable. Do not give them until bleeding is checked.

In a state of collapse from loss of blood, death may often be prevented by forcing the blood into the body from the limbs, by raising feet and bandaging legs from toes to body and arms from tips of fingers to arm pits with roller bandages.

For *slight burns*, exclude air by thin paste of water and baking soda, starch or flour. Ordinary vaseline or carbolized vaseline, olive oil, fresh lard or cream may be used. Smear over burn and on cloth to cover it. Hold dressing in place with light bandage. In second and third degree burns, a doctor should always be called, as there is severe shock and pain. In removing the clothing care should be taken as the clothing is apt to stick to injured surfaces. Cut it away. The portions which remain fast may be softened later, with oil or warm water and carefully removed.

Acid burns should be washed under flowing water and neutralized with an alkali, or solution of baking soda or soap suds. Lime water is excellent. For acid in the eye, wash out as quickly as possible with water and follow with lime water or bicarbonate of soda. For carbolic acid burns, pour on alcohol freely. Wash off *alkali burns* as quickly as possible under running water. Neutralize with vinegar, lemon juice or cider. Eye burns should be washed with a weak solution of vinegar and water or olive oil. Treat like other burns. In severe burns always see doctor, particularly when it is an eye case.

Great caution should be observed in approaching one who has received an electric shock and is still in contact with a live wire. Do not touch with bare hands. Rubber gloves are the best protection. Take hold of the coat or skirt with hands inside of sleeves of a coat and remove from the wire with a quick jerk, use rubber overshoes or rubber raincoat to insulate the hands. If the ground is wet, stand on a dry board or newspapers. If the wire is lying on the victim, brush away with a dry stick. Never use a wet stick or anything made of metal. Don't approach closer than 18 inches. When clear of wire start the prone pressure method of resuscitation at once. Delay may mean death. Electrical burns require a doctor. In the meantime use the first aid methods for burns.

In *heat exhaustion* send for a doctor. Remove patient to a cool place and lay down in a comfortable position with clothing loosened. Do not apply cold externally, give small

quantities of cold water. Stimulants such as tea, coffee or aromatic spirits of ammonia should be given. Keep up bodily warmth.

For *frostbite and freezing*, rub frozen part with snow or cold water. Then use warm water gradually. Never apply heat immediately. It may result in mortification of the frozen part. In freezing, a condition similar to a local frostbite prevails over the greater part of the body. To treat take into a cold room, rub limbs toward body with cloths wet in cool water. Increase temperature of room gradually. Cloths should be wet in warmer and warmer water. As soon as conscious and can swallow give aromatic spirits of ammonia in water, or tea or coffee. It is dangerous to place before open fire or in hot bath until patient begins to recover. Increased pulse, better breathing and more warmth and color in skin show recovery.

Often a *bruise* is the least serious part of an injury. Make sure that there is no other injury, as broken bones. Bruises of the chest and abdomen often accompany internal injuries. These severe bruises require the immediate attention of a doctor. If shock is severe after a bruise of the abdomen or chest there is serious danger of internal injuries.

A handkerchief wrung out in ice water or an icebag should be applied immediately in *black eyes*. The ice water constantly renewed, thus combining the effects of both cold and moisture. Keep up for an hour. It will prevent discoloration. If the flesh has become black, applications of hot water for half an hour, three times a day, are good. If there is pain, see a physician to make sure that there is no eye injury.

Wash *blisters* thoroughly in hot water, pass a clean needle through a flame and prick at the side, gently pressing out the fluid until flat.

For *strains* use rest, and gentle rubbing with alcohol and water, equal parts, arnica, liniment or witch hazel. The rubbing should be vigorous. Later hot water bags will often give relief. When the pain is reduced, gentle movements should be practiced. Always call a doctor when severe or in doubt. Begin treatment at once. Rest in order not to do more damage by rubbing the injured joint surfaces together. Less blood will come to the part if elevated. Application of heat or cold will contract the blood vessels and limit the escape of blood. Cloths wrung out in very hot or very cold water

should be applied. Place injured part under a cold or hot water tap. Use hot instead of cold water for children, or old people or when there is shock. Either heat or cold should be applied long enough to get the full benefit, that is 24 to 48 hours. A severe sprain, especially of the ankle, requires a physician. Under X-Ray they often prove to be fractures.

Do not try to put a dislocated joint back if a doctor can be reached. Cover with cloths wrung out in very hot or cold water. Apply pad under armpit and put arm in wide sling. Dislocation of the second joint of the thumb requires a doctor. Others are less difficult. A dislocated finger should be grasped firmly on the hand side. The end of the finger can then be pulled straight out away from hand and bone will usually slip into place.

If cinder or any other object gets in the eye, avoid rubbing as it drives the object more deeply into the eye or lid and makes it harder to remove. First close the eye so that tears will accumulate and the object will be washed out or loosened and easy to remove. If this fails, turn up lid carefully over a match or toothpick and brush across it carefully with the corner of a clean handkerchief, or absorbent cotton. If this fails, see a doctor.

If a small object becomes wedged in ear, care must be taken not to push it in farther by awkward attempts to remove. Tweezers may succeed, otherwise see a doctor.

Children often get peas or beans in their noses. Try to dislodge by having them blow through the nose with the other nostril closed. If this fails, call a doctor before any swelling occurs, which will make removal difficult.

POISONING

In carbolic acid, creosote, lysol and sulpho naphthol cases, give epsom salts, castor and olive oil, three or four eggs or alcohol which neutralizes it.

In corrosive sublimate (mercury, bichloride) give freely of whites of egg, beaten up in water, and then empty stomach and repeat the eggs.

For iodine cases give starch and water, bread and water, empty stomach and repeat milk, white of egg and stimulants.

Lye, caustic potash, caustic soda and ammonia cases, give olive oil followed by vinegar and lemon juice.

Ptomaine cases:—Any emetic such as mustard or salt water. When stomach is empty give large dose of castor oil

and strong coffee. Keep warm and avoid food until recovery.

Phosphorus, matches, rat poison:—Avoid oils, give emetics, clean out stomach, then give magnesia or chalk, and mucilaginous drinks.

Toadstools:—Give emetics, castor oil, catharties, stimulants, external heat.

Wood Alcohol:—Use emetics and apply heat over heart and to hands and feet. Give strong coffee, inhale ammonia, and call a doctor.

Lead, paints, etc.:—Empty stomach; give tablespoonful Epsom or Glauber salts in glass of water, raw white of egg and castor oil.

Arsenic, Paris Green:—Give emetics at once; then 4 ounces hydrated oxide of iron and magnesia at one dose. Raw eggs, beaten up in sweet milk, freely followed by sweet oil. Keep extremities warm and use stimulants. Magnesia may be used,

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